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**Deepwater Horizon Likely Regulatory Game Changer**

*Will the Role of Class within the Offshore Sector Change?*

The Deepwater Horizon was a semisubmersible drilling rig in the fleet of the world’s largest offshore drilling contractor, Transocean. It was classed by ABS and on lease to BP in the Gulf of Mexico, completing the final cementing of the successful well at the Macondo Prospect Field, 5,000 feet below the surface and some 40 miles offshore Louisiana.

On 20 April 2010, it experienced a well blowout that caused an explosion on the rig and a fire that could not be extinguished. Two days later, the Deepwater Horizon sank, rupturing the riser from the well and leaving oil gushing into the waters of the Gulf. Eleven people aboard the unit were killed.

With time, as the well defied efforts to plug the flow of oil and gas, the incident became the largest offshore oil spill in United States history. Inevitably, it has given rise to several high profile investigations into the causes. Within the industry, in the media and within the halls of the US Congress questions are being raised.

What were the contributing causes? Was the industry prepared to deal with such a devastating scenario? Are regulations that govern offshore drilling sufficient or do they need strengthening? How would the industry respond to a comparable incident in even deeper water, since the Deepwater Horizon was rated capable of working in water depths of up to 10,000 feet? Formal investigations continue and many questions remain unanswered.

One element appears clear, however: the offshore exploration regulatory landscape will be forever changed as a result of this incident. Already the government agency responsible for the safety oversight of offshore drilling and production, the US Department of Interior’s Minerals Management Service (MMS) has been reorganized into three separate divisions and renamed the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE). It has released preliminary and immediate requirements for the inspection of blowout preventers. More stringent regulation is expected to flow from the many bills put forward in both the US Senate and House of Representatives once finalized and enacted.

Within that new regulatory environment, what will be the future role of the classification societies in establishing safety criteria for the design, construction and periodic survey of not only the drill rigs but also the drilling systems? And to what extent will the government agencies, particularly the US Coast Guard and BOEMRE, look to the classification societies for assistance in implementing the new regulatory requirements? These questions also remain unanswered at this time.

As the leading offshore classification society, ABS works closely with lawmakers, explaining the role of classification and its mission to promote the security of life, property and the natural environment primarily through the development and verification of standards or Rules for the design, construction and maintenance of marine-related facilities.

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*Kenneth Richardson*

**NASA’s Aqua satellite captured this image of the oil slick near the coastline of the Gulf of Mexico.**
Given the current enhanced interest in classification services to the offshore industry, ABS Vice President of Energy Development Kenneth Richardson is asked to explain some key concepts of classification, certification and the reach of class responsibility from a unit’s structure to the various systems.

Q. What does it mean to “class” a vessel?

A. Classification societies establish and apply technical standards in relation to the design, construction and survey of marine-related facilities, including ships and offshore structures. ABS is a not-for-profit classification society whose mission is to serve the public interest by promoting the security of life, property and the natural environment. Through the review of plans and the survey of construction processes, ABS verifies that a vessel or other marine structure has been designed and built in accordance with one or more sets of Rules developed by ABS. A marine structure which has been verified as having been designed and built in accordance with the applicable ABS Rules is eligible to receive a Certificate of Classification.

Q. Why would someone seek classification?

A. ABS Rules are based on sound, first principles of engineering and industry practice and, as such, provide a baseline for demonstrating that key structural aspects and systems of the marine structure have been designed and built in accordance with such principles and practices. Companies may seek classification because their financiers or insurance underwriters require verification that a vessel is designed, built and maintained to appropriate classification standards; to conform with underwriting requirements; as an indication of due diligence or proper maintenance on the part of the shipowner; or to conform with statutory requirements.

Q. What aspects of an offshore rig does classification review?

A. Classification has provided owners and operators in both the marine and offshore sectors with a process that works in harmony with flag and coastal State regulations, both prescriptive and performance-based. With respect to offshore exploration and production activity, classification normally addresses hull, machinery and stationkeeping. Additionally, classification can address industrial functions carried out on the unit, such as drilling and hydrocarbon production but these aspects are voluntary, to be selected by the owner/operator.
A lot of offshore equipment is certified rather than classed. There is a key difference between the two. Certification is the equivalent of a snapshot; it only certifies that the item inspected meets the relevant standard at the time of the inspection. Classification is a life cycle approach that uses periodic and damage surveys to verify that the unit and its equipment are maintained in conformance with the relevant standards over the life of the unit.

Q. Does classification cover drilling systems on board a unit like the Deepwater Horizon? Is a blowout preventer (BOP) part of these systems? How is this type of equipment reviewed?

A. In US waters and the US Outer Continental Shelf (OCS), it has not been a mandatory regulatory requirement for drilling systems to be reviewed through the classification model. ABS does have an established process for both certifying and re-certifying drilling equipment, including blowout preventers.

This is done to the standards contained in our published requirements for drilling systems certification (CDS) that have been developed with input from a variety of interests and take into account other widely recognized standards where appropriate.

The certification (and/or re-certification) process is based on both a detailed engineering review of the design against ABS and other relevant published standards, together with a physical examination of the equipment and assessment of the materials used in its fabrication to verify compliance with those standards. These engineering and survey evaluations, when satisfactorily concluded, allow ABS to confirm, through the issuance of the relevant certificates, associated reports and documentation, that the equipment has been found in compliance with the applicable ABS or other standard.

When re-certifying such equipment, this documentation attests that the modifications and repairs (including weld repairs on both pressure retaining and controlling components) which have been carried out on the equipment have been adequately documented, evaluated against the applicable standard and approved.

A key element of the foregoing process is the examination of the equipment, including, as far as reasonably practicable, a meaningful internal examination. As with all classification processes, we rely on the professional judgment of our surveyors to specify the necessary degree of examination, based on the condition of the equipment as found at the time of the inspection.

Q. What role does ABS see for classification societies in the future?

A. We believe that a robust offshore safety regime must be based on clear, recognized technical standards, an appropriate engineering evaluation of the design, including modifications, against those standards, and in-field inspection and examination of the equipment, its components and materials to verify compliance with the published and accepted standard.

The process mirrors that which is used internationally for the mobile offshore drilling units themselves in terms of their structure and principal machinery and equipment. It is also comparable to the approach adopted by other nations.

We are of the opinion that the leading classification societies have the experience, the knowledge and a nationally and internationally accepted process for establishing and verifying conformance with robust safety standards that the Administration is seeking. ABS believes that the classification model should be considered as one of the principal elements within the regulatory safety regime governing future operations in the US waters and on the OCS.
New Brazil Offshore Technology Center to Advance Energy Innovation

ABS recently announced the establishment of the ABS Brazil Offshore Technology Center in partnership with the Federal University of Rio de Janeiro (COPPE/UFRJ) to conduct research supporting the development of new technologies for offshore facilities.

Although the research efforts will place a particular emphasis on facilities intended for use in Brazilian waters, broader challenges associated with offshore energy resource extraction will also be addressed. Applied research will be conducted to study a wide range of oil and gas field development issues particularly those associated with ultra deepwater activity and high temperature and high pressure recovery.

It is expected that the research and development facility will become an established fixture on the COPPE/UFRJ campus. “This is a long-term commitment to the University and to the Brazilian offshore community by ABS,” said Robert D. Somerville, ABS Chairman and CEO at the reception to announce the new venture in Rio de Janeiro. “The Federal University of Rio de Janeiro is the ideal partner for this new collaborative effort and we look forward to working with it on joint projects that will have immediate and direct benefit to the offshore industry here in Brazil.”

Noting that “Brazil is home to some of the most innovative technical advances that have taken place in the offshore sector in recent years,” Somerville said that offshore specialists from ABS will collaborate with industry partners, COPPE/UFRJ faculty and students and with representatives from the Petrobras Research Center, CENPES on these new projects.

ABS Senior Vice President of Technology Peter Tang-Jensen said the first research project to be undertaken by the center will be a study on torpedo piles, an innovative mooring anchor system that has been developed by Petrobras. The study is expected to result in the development of a rational approach for the class review and approval of torpedo piles.

Other initial research topics being considered include: coupled motions; connections between risers and floating production, storage and offloading (FPSO) units; and risk-based stability criteria for self-elevating drilling units.

Associated with establishing the center, ABS announced a commitment to further the education of Brazilian students in naval architecture or offshore engineering by providing ABS-funded scholarships. The society will underwrite a COPPE/UFRJ graduate student to pursue energy-related research.

“Working in concert with members of the industry, both locally and globally, as well as reaching out to our colleagues at CENPES and assisting students to carry out new research, ABS wants to be the catalyst for a new generation of technology solutions for ultra deepwater energy development,” said Tang-Jensen.

ABS Senior Vice President of Technology Peter Tang-Jensen and Professor Segen F. Estefen, Director of Technology and Innovation, the Federal University of Rio de Janeiro (COPPE/UFRJ).

Officials attending the announcement of the ABS Brazil Offshore Technology Center, from left, Jose C. Ferreira, ABS Regional Vice President, South America; Peter Tang-Jensen, ABS Senior Vice President, Technology; Robert D. Somerville, ABS Chairman and CEO; Professor Segen F. Estefen, COPPE/UFRJ Director of Technology and Innovation; and Mauro Oliveira, CENPES Representative.
ABS Offers Free Casualty Response Services for Newbuildings

Effective 1 July 2010, owners of all new ABS-classed tankers, bulk carriers, large gas carriers, containerships and tank barges are being offered free enrollment of these vessels to the ABS Rapid Response Damage Assessment (RRDA) Program that provides 24/7 technical support should the vessels be involved in a casualty.

The free one-year enrollment offer will also waive the charges associated with developing the electronic model of the vessel that is used for conducting the damage stability calculations.

In addition, vessels that elect to enter the program will be offered the new ABS voluntary class notation RRDA, which will provide evidence to port State authorities and other interested parties that the vessel meets the requirement to have access to a shore-based damage stability capability.

“Governments and society expect shipowners to operate with zero incidents,” says ABS Chairman and CEO Robert D. Somerville in announcing the expanded RRDA Program. “When there is a casualty, the owner is expected to deal with it as expeditiously as possible with minimum impact on the environment. We have been helping many of our clients to do that for the last several years but, in talking with them, we realize that we can do more as the pressures that are placed on an owner in the aftermath of a casualty have grown significantly.”

Robert D. Somerville, Chairman and CEO, ABS

It has been that feedback that spurred ABS to expand the range of services provided to owners enrolled in the RRDA Program to include detailed hull girder ultimate strength and local buckling and ultimate strength analyses of the vessel in the damaged condition. By applying the proprietary ABS Sea Environment Assessment System (SEAS) global wave data, the society is then able to evaluate the...
hull girder and local strength for any planned repositioning of the vessel to a repair facility.

“As the class society with access to the technical information related to the vessel and a significant number of advanced structural analysis tools, we are in the position to do more than just provide the immediate stability calculations that have characterized rapid response programs to date,” says Somerville. “We view this service as part of the wider, more holistic approach we are taking toward vessel safety, making better use of the large electronic warehouse of data on each of the ABS-classed vessels that we hold.”

A key element of the expanded RRDA service is the integrated nature of the ABS electronic system. The RRDA ship model is an extension of the Hull Maintenance model that ABS has been supplying free to owners of new ABS-classed vessels delivered since 1 January 2009 as part of the very successful ABS Newbuild Program.

“We are able to integrate the modeling we do as part of either the Common Structural Rules evaluation of a tanker or bulk carrier or an ABS SafeHull evaluation of the other vessel types, the modeling for the Hull Maintenance Program and the analytical programs that we use to then perform a complex strength evaluation of a damaged vessel’s structure in a very, very short period of time,” Somerville explains. “As a consequence, the owner has far more complete information available upon which to base his decisions when coping with a casualty.”

The modeling of the vessels is being undertaken through ABS Nautical Systems, a division of ABS that is a leader in providing advanced software solutions to shipowners’ fleet management and operational activities.

“Providing a more sophisticated approach to vessel casualty response is a natural outgrowth of our activities,” says Tom Blenk, Nautical Systems Vice President, Global Operations. “The range of services that we offer is being steadily expanded to address a much broader range of operational issues that confront the modern shipowner and then integrating these with the vessel’s classification in a way that provides ABS with a unique differentiator.”

As with most RRDA Programs, the ABS offering is also available to non-ABS classed ships several hundred of which are currently in the program. These will now have access to the broader analysis that is being made available. Non-ABS classed newbuildings will also be accepted into the program but will be subject to fees for creating the initial electronic model and for the first and subsequent year services.

A small number of offshore exploration and production facilities are currently enrolled in the ABS RRDA Program. They will continue to receive the basic service. However, ABS is currently developing a companion program that will be able to more quickly carry out advanced analysis of these more complex structures.

“Offshore casualties are, thankfully, rare but they do occur,” says Somerville. “The stability and structural analysis of these units – including jackups, semisubmersibles, drillships and spars – is much different to the analysis of commercial ships. Once again, ABS has the data and the tools to be able to undertake the modeling and analysis. Our challenge is to be able to conduct these analyses within the short period of time needed for the operators to make rapid decisions based on a sound assessment of the structural condition and stability of the unit. We look forward to releasing this further enhancement of the RRDA Program in the near future.”

Teekay Selects ABS Nautical Systems as its Fleet Management Provider

Teekay will implement the Maintenance & Repair, Purchasing & Inventory and Drydocking modules from the ABS Nautical Systems (ABS NS) software suite, NS5. Replacing a legacy management software system, the fully integrated system will provide Teekay with a more streamlined approach to fleet management.

“We had a very focused selection process and criterion in place,” says Lesley Green, Manager, TMS Business Systems, Teekay. “It was important that we chose a company with extensive maritime industry experience and the ability to support us – now and into the future.”

Since the kick off of the project, ABS NS has mobilized a team to Vancouver, BC to provide onsite support and to work side-by-side with Teekay to facilitate the project’s success. The NS5 modules will be initially installed on Teekay’s fleet of 21 shuttle tankers and two newbuilds.

“ABS Nautical Systems has provided us with a knowledgeable onsite team to help develop and implement the software,” adds Green. “We are confident that with the system’s integration capabilities and the team’s experience, this project will be a success.”

As the world’s fastest-growing provider of integrated fleet management software for the maritime industry, ABS NS is able to offer standardized, yet flexible solutions for fleet owners and operators to better manage their day-to-day needs. The NS5 suite of software products will help Teekay manage its needs while increasing crew productivity and reducing operating costs.

ABS & NAVSEA Expand Working Relationship

ABS and the US Naval Sea System Command (NAVSEA) recently signed an addendum to the cooperative agreement originally established in 2003. Under the expanded agreement, ABS will provide greater assistance to the Navy and its Naval Combatant Ships Program by incorporating joint research and development into the standards development process. The new agreement also calls for the execution of joint training to enhance the skills of naval surveyors and ABS assistance in the development of service life assessments for certain existing classes of US Navy vessels.

“This addendum further strengthens the strong strategic partnership between ABS and the US Navy,” says ABS President and COO Christopher J. Wiernicki. “The Achieving Service Life Program in particular shows potential for considerable benefits for both parties.”

Service life assessments take existing risk-based survey programs developed for commercial ships and tailor them to the specialized needs of naval ships. Originally a pilot program on four existing naval ships, the initiative has been expanded into a multi-year program that has become ABS Government Operations’ most robust support program for government ships since the development of the Naval Vessel Rules.

ABS surveyors and naval engineers developed the program by conducting a special survey, strength analysis and fatigue analysis on each ship in the pilot. The ships ranged in type from an amphibious support craft to a guided destroyer to a frigate and lastly a cruiser. The intent is for this program to extend far into the next decade of the US Navy’s fleet.
Pre-survey Checklists Now Available for Nautical Systems’ Clients

New Tool Integrates Class Surveys with Fleet Management Software

Ship operators who use the NS5 Maintenance & Repair module offered by ABS Nautical Systems now have the capability to pre-plan their ABS surveys based on the ship and survey-specific checklists used by the class society’s surveyors.

Through a new Survey Planning tool in NS5, users may synchronize their onboard Maintenance & Repair module with the ABS Eagle Survey Manager software used by the society to manage survey status for their customers. Once synchronized, users can order survey requests, download pre-survey work packs and create work orders or service purchase orders as necessary.

“These new tools will streamline the class process,” says ABS Director of Applied Innovation Chris Serratella who is leading many of the class and NS5 integration projects currently underway. “Findings may be minimized, thus reducing operators’ added work and unscheduled maintenance,” he adds.

The pre-survey work packs include interactive PDF documents that list the items to be surveyed together with their applicable Rule references and information as to the type of inspection performed by the surveyor, based on the survey selected by the user. Superintendents or engineers on board can then provide comments on the PDF document, save it to the work order and send the completed PDF back to ABS through the ABS Eagle Survey Manager.

Built-in security measures allow ship operators to control which personnel have the ability to conduct survey planning and request surveys from ABS. Additionally, optional subscription services can send users email notifications of surveys coming due any number of months prior to the due date.

Once surveys have been completed and the ABS surveyor has entered his or her findings into ABS Eagle Survey Manager, NS5 users will receive an email notification so they may synchronize this information into the NS5 software, keeping all records up-to-date in one database shared by the office and vessels.

Seen as a first step toward a more complete integration of class and the NS5 fleet management software, the plans are to evolve the PDF documents into a user interface and soft-data share incorporated into the NS5 software. “We really want the NS users to have the opportunity to experience the pre-survey planning tools before we fully incorporate the process into the software,” explains Serratella. “This will allow us to design the interface based on their specifications and feedback.”
Essar Shipping Receives ABS HSQE Certification
First Indian Shipowner Certified to OHSAS 18001:2007

Following the certification completed by ABS and ABS Quality Evaluations, an affiliate of ABS, Essar Shipping Ports & Logistics Ltd., will be awarded the OHSAS 18001:2007 certification. They are the first shipping company in India to receive certification to this leading standard for health and safety management systems.

One of the largest shipping companies in India, Essar operates a fleet of 25 vessels and has a history of setting quality standards for its compatriots, having also been the first shipowner in India to achieve ISM certification for bulkers and tankers.

HSQE certification from ABS is a voluntary measure shipowners can take to certify their operations to the standards of ISO 9001, ISO 14001 or OHSAS 18001. The required elements to achieve certification are detailed in the ABS Guide for Marine Health, Safety, Quality and Environmental Management. The Guide provides practical guidance for shipowners and operators seeking to achieve certification to one of these four standards, including a cross-reference between the standards on common elements such as control of documents, customer focus and emergency preparedness.

To further assist shipowners and operators in their endeavors to achieve certification, ABS is developing an online query tool based on the Guide that facilitates the comparison between the four standards. Due for release in late 2010, the ABS Eagle HSQE Navigator program identifies actions that the operator may need to undertake to achieve the desired certification based on industry best practices.

Essar’s SMITI, a 281,396 dwt oil tanker is dual classed by the Indian Register of Shipping.

ABS Wins Another Best Classification Society Award in 2010
The class society receives awards from Seatrade and Marine BizTV

Following closely on the heels of receiving Seatrade’s Asia classification society award earlier this year, ABS is honored to have also been selected as the recipient of Marine BizTV’s equivalent award at its 4th International Maritime Awards ceremony in Dubai.

Marine BizTV’s best classification society award recognizes the contribution of a classification society towards the development of the maritime sector, whether through innovative products and services offered for technical, operational or commercial support to the industry. Recipients are selected based on the society’s commitment to safety, quality, social and environmental responsibility and its diligent effort and involvement in the training and development of personnel. Joseph M. Brincat, ABS Regional Vice President, Middle East accepted the award on the society’s behalf.

ABS Regional Vice President, Middle East Joseph M. Brincat (right) receives the award from Juerg Bartlome, Managing Director of Goltens Dubai Ltd.
Shipowners have a two-year period to prepare for the new 200 nautical mile USA/Canada emission control area (ECA) which has been adopted by the IMO. The regulations to implement this ECA are expected to enter into force in August 2011, with the ECA becoming effective from August 2012.

This latest ECA was adopted during the Marine Environment Protection Committee's most recent session and applies to the waters adjacent to the Pacific, Atlantic and Gulf coasts of Canada and the United States including the waters surrounding the Hawaiian Islands, excluding the Aleutian Islands and the Arctic coastline. It sets limits on the emission of sulfur oxides (SOx), nitrogen oxides (NOx) and particulate matter from ships within the area.

The US Environmental Protection Agency is also investigating whether other areas such as the US territories of Puerto Rico, the US Virgin Islands, the Pacific US territories and Western Alaska may warrant consideration for future controlled areas.

Once in effect, fuel oil sulfur content for ships transiting this area will be required to meet the 1 percent limit, the same as applies to the two current ECAs (the Baltic and North Sea areas). For all three controlled areas, the sulfur content limit reduces to 0.10 percent on 1 January 2015. Alternatively, ships burning fuels having sulfur contents greater than that indicated above may achieve compliance in accordance with the equivalency provisions of MARPOL VI/4, such as exhaust gas scrubbing, except off the coast of California where local regulations apply.

In addition to the low sulfur provisions for the ECA, engines installed on ships constructed on/after 1 January 2016 which operate within an ECA will need to meet the NOx Code Tier III emission standard.

The ABS Fuel Switching Advisory Notice provides a comprehensive review of IMO and regional regulations for sulfur limits and offers operational guidance for owners to properly carry out the changeover from heavy to marine gas oils for both the main engine and the auxiliary boilers. The Advisory Notice is available for free download from the ABS website at www.eagle.org. Navigate to Resources, Booklets & Bulletins.
After seven years in development, goal-based ship construction standards (GBS) for bulk carriers and oil tankers have been approved and the countdown has been set for their application on new ships starting 1 June 2016.

The new regulations, which will be adopted into SOLAS II-1/2 28 and II-1/3-10 will require newly constructed bulk carriers of 150 m in length and above (excluding ore carriers and combination carriers) and oil tankers of 150 m in length and above, to be designed and built to classification Rules which have been verified by the IMO as meeting the new goal-based ship construction standards.

The new standards are organized into five tiers that incrementally refine the requirements, starting with the Tier I goal that “ships be designed and constructed for a specified design life to be safe and environmentally-friendly, when properly operated and maintained under the specified operating and environmental conditions, in intact and specified damage conditions, throughout their life.”

Tier II identifies the functional requirements to be satisfied. Tier III specifies the procedures for verifying that the Rules and regulations for ship design and construction conform to the Tier I and Tier II requirements. Tier IV consists of the verified classification Rules and relevant IMO regulations and Tier V reflects industry standards and best practices that facilitate compliance with the goals and functional requirements. The resolutions adopted during the 87th session of the Maritime Safety Committee (MSC) cover Tiers I to III.

The specified design life stipulated under Tier II is to be not less than 25 years, for North Atlantic environmental conditions; the same as those set forth by IACS Common Structural Rules (CSR) for bulk carriers and oil tankers. In addition to the design life and environmental conditions, the functional requirements in Tier II call for new construction standards to take into consideration:

- structural and residual strength
- fatigue life
- corrosion protection
- structural redundancy
- watertight and weathertight integrity
- human element conditions
- design transparency
- construction quality procedures
- survey during construction
- in-service survey and maintenance
- structural accessibility
- recycling

New oil tankers and bulk carriers are defined as those ships for which the building contract is placed on or after 1 July 2016 or, in the absence of a building contract, the keels of which are laid or which are at a similar stage of construction on or after 1 July 2017; or (regardless of the contract or keel laying date), the delivery of which is on or after 1 July 2020.

GBS also requires the creation of a ship construction file (SCF) containing specific information on how the functional requirements of GBS were applied to the ship during design and construction. The SCF is to be provided on delivery of a new ship and kept on board the ship and/or ashore so that it is available to the ship’s owner, classification society and flag State throughout the ship’s service life. The SCF is to be maintained and updated even if the ship’s ownership changes. Circular MSC.1/Circ.1343 available on the IMO website (www.imo.org) offers a detailed listing of the information to be included in the SCF.

The verification of conformity process set forth in Tier III provides for a review board consisting of persons

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<th>Date</th>
<th>Description</th>
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<tbody>
<tr>
<td>31 Dec. 2013</td>
<td>Deadline to submit Rules to IMO for verification</td>
</tr>
<tr>
<td>31 Jan. 2016</td>
<td>IMO prepares audit results documentation report</td>
</tr>
<tr>
<td>16 May 2016</td>
<td>IMO gives decision on submitted Rules</td>
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<tr>
<td>1 June 2016</td>
<td>GBS is in effect for new construction</td>
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nominated by the collective flag Administrations which are members of the IMO, to verify that Rules submitted by classification societies are in accord with the functional requirements.

To be considered among the first group considered for GBS compliance, ABS and other societies will submit their Rules to IMO for verification of conformity to GBS by the end of 2013. As Rules may be submitted by a collection of societies, IACS is in the process of harmonizing the Common Structural Rules (CSR) for oil tankers and bulk carriers, which were developed separately, with respect to key considerations such as wave loads, fatigue, finite element analysis and buckling. The harmonized CSR will consist of three parts; a common part for general hull requirements for both ship types and two separate parts for ship-type specific requirements applicable to oil tankers and bulk carriers, respectively. The harmonization project has been expanded to also check CSR compliance with the IMO GBS and to fill identified gaps.

The IMO will have until 16 May 2016 to complete the verification process and to decide whether the first groups of submitted rules comply with the functional requirements stipulated in Tier II. Oil tankers and bulk carriers subject to the SOLAS regulation will then be required to comply with classification Rules verified as complying with the IMO GBS as a requirement for SOLAS certification. GBS compliant class Rules will apply to bulk carriers and oil tankers contracted for construction from 1 July 2016; 14 years after the idea to establish goal-based ship construction standards was first presented to the IMO in 2002. It should be remembered that the harmonized CSR which will be formulated to comply with the GBS, although not confirmed yet, will be in effect 1 January 2014 when they are submitted to IMO.

### Rules for the Rules

New construction standards to be formulated based on the IMO Tier I Goal Requirements

SOLAS II-1/3-10, Goal-based ship construction standards for bulk carriers and oil tankers, require that: “Ships shall be designed and constructed for a specified design life to be safe and environmentally-friendly, when properly operated and maintained under the specified operating and environmental conditions, in intact and specified damage conditions, throughout their life.” And that:

**I.1 - Safe and environmentally-friendly** means the ship shall have the adequate strength, integrity and stability to minimize the risk of marine pollution to the environment due to the ship’s structural failure resulting in flooding of or loss of watertight integrity.

**I.2 - Environmentally-friendly** also includes the ship being constructed of materials for environmentally acceptable recycling.

**I.3 - Safety** also includes the ship’s structure, fittings and arrangements providing for safe access, escape, inspection and proper maintenance and facilitating safe operation.

**I.4 - Specified operating and environmental conditions** are defined by the intended operating area for the ship throughout its life and cover the conditions, including intermediate conditions, arising from cargo and ballast operations in port, waterways and at sea.

**I.5 - Specified design life** is the nominal period that the ship is assumed to be exposed to operating and/or environmental conditions and/or the corrosive environment and is used for selecting appropriate ship design parameters. However, the ship’s actual service life may be longer or shorter depending on the actual operating conditions and maintenance of the ship throughout its life cycle.
Corrosion Prevention for Cargo Oil Tanks

New Standards Look to the Future of Steel

SOLAS has been amended to require the under deck and the bottom of cargo oil tanks on newly constructed crude oil tankers and crude oil/product carriers to be protected against corrosion in accordance with one of three methods which were adopted at the 87th session of IMO’s Maritime Safety Committee.

Vessels whose contracted date or keel laying occur after 1 July 2013, or whose delivery date is after 1 January 2016, can now elect to protect their cargo oil tanks by:

- applying protective coatings which have been verified to comply with the new IMO Performance Standard;
- using an alternative means of corrosion protection; or
- using corrosion resistance material to maintain required structural integrity for 25 years in accordance with the Performance Standard for alternative means of corrosion protection.

Far from the traditional view taken that IMO is behind the times, the entry of corrosion resistance material into the amendments demonstrates a forward-looking approach as the industry has yet to develop steel proven to meet these standards.

Factors such as the sulfur and salt water content levels within the product being carried create high variability of corrosion occurrence, thus making it difficult for a universally resistant material to be blessed for all cargo oil tanks. A cargo tank carrying crude direct from an FPSO, for example, may demonstrate greater degradation than a tank transporting crude oil from a land-based storage tank due to the higher salt water amounts.

While materials such as stainless steel have demonstrated long-term resistance to corrosion, success has been isolated to chemical carriers rather than on crude or oil product carriers. New steel developments such as Nippon Steel’s NSGP-1 are showing promise as a corrosive-resistance material both in the lab and in initial validation trials, but have yet to pass the test of time to fully substantiate their use for the specified lifespan of 25 years.

IMO it seems is looking to the future of steel and writing standards based on the next generation of technology.
A Regulatory Advisory for Operators

Paris MoU Announces New Inspection Regime

Starting 1 January 2011, the Paris MoU on Port State Control will begin a new inspection regime based on an enhanced risk profile for ships visiting ports in the region. The assigned risk profiles will influence the targeted inspections and pre-arrival notification periods which, based on the assigned risk profile of a vessel, may be required 24 to 72 hours in advance.

Under the new regime, ship operators will receive rankings from the MoU similar to those received by flag States and Recognized Organizations. These company rankings will be calculated based on historical detentions, deficiencies and good inspections of the entire fleet of a company. A preliminary calculator is available on the European Maritime Safety Agency’s (EMSA) website so operators can evaluate their ranking.

MARPOL Revisions Restrict Heavy Fuel Oil Use in Antarctic

Starting 1 August 2011, with the exception of vessels engaged in securing the safety of ships or in performing a search and rescue operation, the carriage in bulk as cargo or carriage and use as fuel of the following oils in the Antarctic area will be prohibited.

- Crude oils having a density at 15°C higher than 900 kg/m³ or a kinematic viscosity at 50°C higher than 180 mm²/s, or
- Bitumen, tar and their emulsions.

These new regulations were added to MARPOL Annex I during the Marine Environment Protection Committee’s 60th session.

Operators seeking more information on the new inspection regime may find additional details by visiting the Paris MoU or EMSA websites.

ParisMoU: www.parismou.org
Select New Inspection Regime from the left menu.

EMSA: www.emsa.europa.eu
Navigate to Implementation Activities, Ship Safety, Port State Control to locate the Ship Risk Profile calculator.

The ABS summary of the Marine Environment Protection Committee’s 60th Session is available for free download on the ABS website at www.eagle.org. Navigate to Resources, Regulatory Newsroom.
Designers, shipyards and owners are facing what promises to be an extraordinarily innovative period in the development of ship forms, engine efficiencies and new equipment as they strive to meet the many new regulatory environmental standards aimed at minimizing the industry’s adverse impact on the environment.

“We want ABS to be the class society of choice for the new generation of environmentally-friendly and energy efficient ships and for ships using alternative fuels and propulsion systems,” says ABS Vice President of Global Technology and Business Development, Kirsi Tikka. “That means staying at the forefront of these technical developments and, at the same time, preparing practical guidance and standards that address the changes these regulatory developments will impose.”

Recent examples include the detailed analysis that ABS conducted on the IMO’s Energy Efficiency Design Index (EEDI) and advisories that the society has issued on managing the switch to low sulfur fuels when entering emission control areas and on ballast water management, all of which have raised technical concerns regarding their application.

“Virtually every sector of the marine industry is looking to the leading classification societies for information and technical guidance in the face of the rapidly growing number of environmental regulations at the local, regional and international levels,” Tikka emphasizes. She cites the New York state ballast water treatment standards that are one thousand times more onerous than the internationally agreed standards of the IMO as a notable example.

“It is becoming a maze that is extraordinarily difficult to navigate for even the most conscientious owner whose primary focus is on the commercial operation of his ships,” says Tikka. “We see our role at ABS as the industry’s technical partner, better positioned to track and understand these new environmental standards in a practical and implementable manner. Talking to owners and shipyards we find there is heightened awareness of all these new environmental issues but there is still a tangible need for specific, practical training and advice.”

Tikka says achieving sustainable energy efficiency is perhaps the biggest challenge. “Energy efficiency is really interesting because, although it is about emissions, it also has a very significant commercial aspect. It’s about cost management which is becoming a bigger issue. An energy-efficient ship may incur a small capital cost penalty – although that is not yet entirely clear – but, unlike the results of so many regulatory initiatives, it offers the potential of very significant operational cost savings over its lifetime,” she says.
Fuel cells have the potential to deliver propulsion power that is cleaner and more efficient than burning fossil fuels in marine engines. But what are the pay-offs in terms of performance, CO₂ emissions and potential applications? Given the pressure on the marine industry to improve energy efficiency and manage emissions, the answers could be important for judging how far alternative fuels can contribute to the energy mix.

ABS Director of Environmental Technology Yoshi Ozaki explains that fuel cells use hydrogen and oxygen (or air) as fuel to generate electricity. Hydrogen can be generated from fossil fuels such as natural gas or bio-synthesized by a process called reforming. In the US, for example, 95 percent of hydrogen is produced industrially from natural gas by steam methane reforming (SMR). However, one tonne of natural gas and 2.25 tonnes of water produce only 0.5 tonnes of hydrogen and also produce 2.75 tonnes of CO₂ as by-product. In addition to creating CO₂ emissions, SMR requires a considerable amount of heat energy for it to work, creating further CO₂ emissions if fossil fuels are the energy source.

According to the US National Renewable Energy Laboratory, for every tonne of hydrogen produced, 8.9 tonnes of CO₂ are emitted from a SMR plant. Therefore, to have merit from the point of view of CO₂ emissions, SMR requires a considerable amount of heat energy for it to work, creating further CO₂ emissions if fossil fuels are the energy source.

Some high temperature fuel cells can internally reform fossil fuel into hydrogen without the need for an external heat energy source, thereby significantly improving efficiency and CO₂ emission performance. However, among the many types of fuel cells being researched today, only a handful are thought to be suitable for marine applications, says Ozaki, including molten carbonate and solid oxide fuel cells (SOFCs).

These applications can reform natural gas or other hydrocarbon fuels internally without the need of an external energy source for reformation, he explains. This internal reformation could result in much higher energy efficiency and better CO₂ emission performance compared to the conventional power plant of the same output.

These high temperature fuel cells have been commercialized and are available in the market but, at present, capacity is limited to about 4MW maximum. If they prove scalable to 10MW, they could make fuel cell power plants potentially viable for shipboard use.

“Marine applications continue to present unique technical challenges,” says Ozaki, “not the least of which is a fuel cells dynamic response characteristics – its ability to deliver power quickly enough for a full-astern command in an emergency. There are also issues of start-up time, fuel storage and system space requirements and the need for a fuel cell ‘safety room’ concept,” he adds.

The cost of production also remains high at present, suggesting that unless the price of marine bunkers increases greatly, fuel cells will remain an expensive option too.

There are numerous other engineering challenges to overcome but, despite the issues noted above, Ozaki suggests that fuel cell-driven power plants are certainly plausible for some marine applications, especially under the likely impact of ever-expanding and increasingly stringent international and regional environmental regulatory regimes.

Are Fuel Cells Viable for Marine Propulsion?

Wärtsilä has been developing fuel cell technology since 2000. Its R&D program has focused on developing a solid oxide fuel cell (SOFC) system fueled by methanol for both decentralized power generation and marine applications. Photo credit: Wärtsilä
Advisory on Ballast Water Treatment Technologies & Regulations Now Available

To assist the industry in better understanding the evolving ballast water management and treatment regulations, ABS has published a Ballast Water Treatment Advisory that provides practical guidance for shipbuilders, owners and operators on how to prepare for the selection, installation and operation of an appropriate treatment system for different ship types.

To address the problem of invasive species, the International Maritime Organization (IMO) adopted the Ballast Water Management Convention in 2004. However, the IMO was forced to defer the implementation date as effective, viable treatment systems still needed to be developed, tested and approved. At present, the convention has yet to reach the required number of signatories for formal ratification, leaving an opening for other entities, ranging from national to State governments, to introduce parochial legislation, some of which imposes discharge standards that are much stricter than the IMO standard.

In the meantime, a burgeoning number of commercial systems have now been developed and have either been approved as meeting the IMO requirements or are in the final stages of gaining type approval. “The ballast water management regulations can be confusing for shipowners because they contain many unresolved and complex issues,” says Kirsi Tikka, ABS Vice President, Global Technology and Business Development.


“What we have attempted to do with this Advisory is to gather practical information relating to both the principal regulatory developments and the types of treatment systems and not only provide this but to also highlight the many technical and design considerations that an owner should take into account for both retrofitting ballast water treatment systems to existing vessels or when specifying the design of a newbuilding.”

The 48-page Ballast Water Treatment Advisory is divided into five sections covering regulatory developments, treatment technologies, considerations for system selection, evaluation

Status of Ratification of the IMO BWM Convention
(As of 30 June 2010)

<table>
<thead>
<tr>
<th>States</th>
<th>% Tonnage</th>
<th>Parties to the Convention:</th>
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<tbody>
<tr>
<td>Needed: 30</td>
<td>Needed: 35%</td>
<td>Albania, Antigua and Barbuda, Barbados, Brazil, Canada, Cook Islands, Croatia, Egypt, France, Kenya, Kiribati, Republic of Korea, Liberia, Maldives, Marshall Islands, Mexico, the Netherlands, Nigeria, Norway, Saint Kitts and Nevis, Sierra Leone, South Africa, Spain, Sweden, Syrian Arab Republic and Tuvalu.</td>
</tr>
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checklists and a technical summary of the principal systems currently available on the market.

Tikka points out that although the IMO has now concluded that the technology and systems are available to treat ballast water, “questions remain as to how these systems will perform in actual operation, in particular those systems selected for installation on vessels such as large tankers and bulk carriers that handle very large quantities of ballast. There is still much to be learned from in-service experience.”

Facilitating this learning, the Advisory is being discussed in detail during the many environmental update seminars ABS hosts throughout the year. Participants are apprised on the current state of treatment technologies and regional regulations, such as the more stringent requirements for vessels operating in New York waters, and discuss the challenges faced in making a treatment system selection.

ABS recently released a Guide for Ballast Water Exchange that specifies the requirements for obtaining the optional classification notation Ballast Water Exchange (BWE). The BWE notation identifies a level of compliance with the applicable regulations contained in the IMO International Convention for the Control and Management of Ships’ Ballast Water and Sediments, 2004, as well as the IMO guidelines referenced in the Convention that address ballast water exchange. The Guide for Ballast Water Exchange is available for free download from the ABS website. Navigate to Resources, Rules & Guides, Downloads, Publication #171.

In addition, ABS is developing a Guide for Ballast Water Treatment Systems to further assist operators in understanding the requirements surrounding the installation and use of treatment systems. The Guide is scheduled for release in the coming months and will be made available on the ABS website for free download.

Factors to Consider When Selecting a Treatment Method

Ship and Vessel Service Characteristics that Impact BWT Selection
- Ship type and capacity
- Ballast water handling practices including NOBOBS (no ballast on board ships)
- Ballast water characteristics
- Vessel service characteristics
- Ballast system characteristics

Treatment Technology Factors
- Treatment method
- Treatment system pressure drops
- Equipment size and space requirements
- Materials, equipment protection (IP rating) and hazardous spaces
- Power requirements
- Impacts on ballast tank and pipe corrosion
- Health and safety (handling, operation and maintenance)

General Treatment System Considerations
- Proven efficacy and official approvals
- Vendor qualifications and reputation
- Maintenance requirements and system reliability
- Simple operation (control and monitoring)
- Life cycle costs

Challenges for Installation Engineering
- Intake/discharge isolation (cross-contamination)
- Sampling and in-service testing
- Maintaining ballasting flexibility

Ballast water flow

At ballasting (at unloading ports)
Revised MARPOL Annex VI Enters Into Force 1 July 2010

Ozone-depleting Substances Logs Now Required

One of the requirements, under Regulation 12 of MARPOL Annex VI, calls for all ships to maintain a list of equipment containing ozone-depleting substances (ODS) and an ODS record book. The regulation covers the recording of ODS use, deliberate and non-deliberate emission of ODS and the disposing of equipment containing ODS from ships.

The purpose of this ODS data tracking is to keep a record of the condition and quantities of ODS on board a ship and serves as the basis for data collection by the relevant flag State.

Ozone-depleting substances means controlled substances as defined in paragraph 1.4 of the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, and listed in Annexes A, B, C or E to the said Protocol in force at the time of application or interpretation of Annex 13 to the Revised MARPOL Annex VI.

Ozone-depleting substances that may be found on board ships include but are not limited to:

- Halon 1211
- Halon 1301
- Halon 2402
- CFC-11
- CFC-12
- CFC-113
- CFC-114
- CFC-115
The definition of ODS and the phase out dates in the Revised MARPOL Annex VI are aligned with the Montreal Protocol, 1987.

Regulation 12 does not apply to permanently sealed equipment where there are no refrigerant charging connections or potentially removable components containing ODS.

Each ship is to maintain a list of equipment containing ODS and also an ODS record book, recording each occasion of actions affecting that equipment such as servicing, maintaining, repairing or disposing of the system or the equipment containing ODS.

Entries in the ODS record book are to be recorded in terms of mass (kg) of the substance and be completed without delay on each occasion with respect to the following:

- Recharge, full or partial, of equipment containing ODS
- Repair or maintenance of equipment containing ODS
- Discharge of ODS to atmosphere: deliberate and non-deliberate
- Discharge of ODS to land-based facilities
- Supply of ODS to ship

The ODS record book can be a part of an existing log book or electronic recording system, provided it is approved by the Administration.

To assist owners, operators and charterers in complying with Regulation 12, ABS has prepared templates for the list of equipment containing ODS and the ODS log sheet for general use. The sample list, log sheet and controlled substances list can be downloaded from the ABS website, www.eagle.org. Navigate to Resources, Regulatory Information, Regulatory Newsroom.

CFCs Back in the Spotlight

Yoshi Ozaki, ABS Director, Environmental Technology recently posted his thoughts on the ODS issue on the Lloyd’s List blog.

Former UN Secretary General Kofi Annan hailed the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted in 1989, as not only a model of international cooperation but as perhaps one of the “single most successful international agreement(s).” Long before SOx, NOx and CO2 began to preoccupy emissions discussions, ozone-depleting substances (ODS), better known at the time as Chlorofluorocarbons, or CFCs, were front and center as the ecological bête noir.

For today’s shipping industry, control of ODS remains an important operational element. Like sulfur and nitrogen oxide emissions, ODS are under the remit of MARPOL Annex VI. New revisions to Annex VI covering the control of emission of ODS on board ships came into force on 1 July 2010. The new requirements address the recording of ODS use, deliberate and non-deliberate release of ODS and the disposal of equipment containing ODS. The regulation does not apply to permanently-sealed equipment where there are no refrigerant charging connections or removable components containing ODS.

Regulation 12 of the revised Annex VI specifies that all ships must maintain a list of equipment containing ODS and an ODS record book. The record book can be part of an existing log book or electronic recording system, provided it is approved by a flag Administration.

The purpose of this data recording is to maintain a record of the condition and quantities of ODS on board a ship that can be provided to the ship’s flag State and to port State authorities when necessary.

ODS are defined as controlled substances in paragraph 1.4 of the Montreal Protocol. The definition of ODS and the phase-out under the Annex VI revision are aligned with the protocol. Specific substances include, but are not limited to Halon 1211, Halon 1301, Halon 2402, CFC-11, CFC-12, CFC-113, CFC-114 and CFC-115. Every ship must record each time actions affecting equipment containing ODS, such as servicing, maintaining, repairing or disposing of the equipment or the substances, are undertaken.

ABS has released practical guidance to assist shipowners in complying with the new requirements. These include prepared templates for the list of equipment containing ODS and the ODS log sheet for general use, both of which are available for free download from the ABS website.

Monitoring of the ozone layer has indicated that the Montreal Protocol has already had a positive effect on the environment. As society pushes ahead in its quest for a greener planet, shipowners are once again being asked to make a further contribution through more stringent oversight in the manner in which ODS are handled aboard their ships.
Volatile Organic Compound Management Plan Now Required

The revised MARPOL Annex VI entered into force on 1 July 2010. Regulation 15.6 requires all crude oil tankers to carry on board and implement a ship-specific, volatile organic compound (VOC) management plan approved by the Administration.

The purpose of the plan is to verify that the operations of a tanker prevents or minimizes the release of VOC as much as possible during cargo loading, sea voyage and discharge of cargo. The VOC plan is to be prepared in accordance with the guideline provisions laid out in MEPC.1/Circ.680. It should be specific to each ship and:

- include written procedures and description of equipment/systems employed for minimizing VOC emissions during the loading, sea carriage and discharge of crude oil cargo;
- follow best management practices for preventing or minimizing VOC emissions;
- give consideration to VOC emission during crude oil washing (COW) operation;
- monitor the extent of VOC release by a system of recordkeeping;
- identify a person responsible for the VOC emissions control management; and
- identify a training program which facilitates the adoption of best management practices for the ship to control VOC emissions.

Additionally, if tanker design modifications are made (such as using the method of increased pressure relief settings for VOC emissions control), the strength aspects need to be considered and evaluated in order to verify the ships’ cargo tank integrity is not affected.

The owner/operator may send the service request letter to the nearest ABS engineering office, together with a minimum of two copies of the ship-specific VOC management plan. Upon completion of review on behalf of the Administration, approved and stamped copies are distributed as follows: one copy to submitter (owner/operator) for placement on board the vessel; and one copy for ABS files.

Alternatively, the ship-specific VOC management plan may be submitted electronically by email to: O2Esubmittals@eagle.org. The approved copy of the VOC management plan, appropriately stamped, will be returned to the submitter electronically.

Gas Detection & Measurement on Tankers

New requirements relating to the detection and measurement of gases on board tankers were adopted by the IMO’s Maritime Safety Committee at its recent meeting. The requirements are in the form of amendments to SOLAS. The existing SOLAS requirement that all oil tankers are to be equipped with at least one portable instrument for measuring flammable vapor concentrations on board has been revised such that instruments carried on all oil tankers (new and existing) must also be capable of measuring oxygen. Compliance is required on entry into force of the revision on 1 January 2012.

Additionally, oil tankers of 20,000 dwt and above, constructed on or after 1 January 2012, are to be provided with a fixed hydrocarbon gas detection system. The system is to comply with the mandatory provisions in the Fire Safety Systems Code and is to be capable of measuring hydrocarbon gas concentrations in all ballast tanks, including the forepeak tank and voids in double-hull and double-bottom spaces that are adjacent to a cargo tank. Oil tankers provided with constant operative inerting systems for such spaces are exempt from this requirement.

The gas detection equipment must be designed to sequentially sample and analyze from each sampling line at intervals not exceeding 30 minutes. Audible and visual alarms are to be initiated in the cargo control room, navigating bridge and at the analyzing unit when the vapor concentration in a given space reaches a pre-set value which is not to be higher than the equivalent of 30 percent of the lower flammable limit.

Photo courtesy of BW Technologies by Honeywell.
As offshore exploration activity moves into deeper waters to access complex reservoir structures, the importance of well testing becomes more critical. A vessel or mobile offshore drilling unit (MODU) with the equipment and capabilities to engage in well testing, either short-term or extended, is key in gathering onsite data to determine the size and quantity of the hydrocarbon potential.

Testing on board these units is usually performed to determine the size, viability and optimum production capabilities of a field under exploration. With a processing plant on board, a well test vessel can extract the products from the well by separating and processing the oil, gas and water.

“Well test vessels, especially those on station for an extended period of time, are relatively sophisticated vessels so this notation now provides a testament to their capability,” says Kenneth Richardson, ABS Vice President, Energy Development. “In terms of systems, you have to consider well control equipment, process pressure vessels, piping and electrical components and control systems.

The newly released ABS Guide for Well Test Systems takes into account the different scenarios during the life of the vessel or unit with flexibility to cover the surface systems and equipment safety aspects. Guidance is provided for both permanent well test systems (well test systems installed on board for at least 30 months are considered permanent and would receive the notation Well Test Service) and temporary well test systems (well test systems installed on board for less than 30 months which would receive the notation WT-TEMP). The Guide also offers a notation to those vessels or units designed to perform well test activities but the well test systems have not yet been installed on board, WT-Ready.

Outfitting vessels or units for well testing means close attention to issues such as the deck structure so that the deck is appropriately reinforced to support the weight of the well test systems. This includes the crude storage tank structure permanently installed on board and designated for crude storage during well testing operations in compliance with applicable class structural requirements, hazardous areas for electrical equipment created by the presence of hydrocarbons and spill containment provided in areas which may be subject to hydrocarbon liquid or chemical spills when the well test system is installed.
Recent Updates to ABS Rules & Guides

ABS Rules and Guides are available for purchase and/or free download directly from the website at www.eagle.org. Sign up to receive email notifications when new publications or notices are available. The following listing reflects Rules and Guides updates from 1 May 2010 to 1 July 2010.

RECENT PUBLICATIONS

NEW Guide for Rapid Response Damage Assessment, July 2010 (Pub 170)
This Guide contains the technical requirements and criteria that meet international regulatory requirements for vessel emergency response. The ABS Rapid Response and Damage Assessment (RRDA) program provides emergency technical services for owners and operators whose enrolled vessel experiences an incident that may affect the stability or structural strength of the vessel or require the rapid provision of technical analytical services. The Guide provides owners and operators with a description of the process for the issuance of the RRDA notation to an ABS-classed vessel. The ABS RRDA notation presents evidence to port State authorities and other interested parties that the vessel meets the requirement to have access to a shore-based damage stability capability. This publication is only available for download.

UPDATE Rules for Building and Classing Steel Vessels, Part 5A, Specific Vessel Types (Chapter 1), Common Structural Rules for Double Hull Oil Tankers, July 2010 (Pub 2)
The structural requirements in Part 5A of the Rules are applicable for double hull oil tankers of 150 m in length and more. For oil tankers with structural arrangements not covered by Part 5A, the requirements in Part 5C, Chapters 1 or 2, are to be complied with. These Rules are applicable for vessels having construction contracts signed between 1 July 2010 and 30 June 2011.

UPDATE Rules for Building and Classing Steel Vessels, Part 5B, Specific Vessel Types (Chapters 3 and 4), Common Structural Rules for Bulk Carriers, July 2010 (Pub 2)
The structural requirements in Part 5B of the Rules are applicable for single side skin and double side skin bulk carriers of 90 m in length and more, with structural arrangements as specified in Part 5B, Chapter 1, Section 1. These Rules are applicable for vessels having construction contracts signed between 1 July 2010 and 30 June 2011.

NEW Guide for Building and Classing Floating Offshore Liquefied Gas Terminals, June 2010 (Pub 169)
This Guide provides criteria that can be applied in the classification of the hull and tank structure of floating offshore liquefied gas terminals with membrane tanks or independent prismatic tanks. The Guide addresses liquefied gas terminals with ship-shaped or barge-shaped hull forms having a single row of cargo tanks at centerline or a row of two cargo tanks abreast. This Guide does not cover the design, fabrication and installation of the liquefied gas containment system except for the structural design of independent tanks. This publication is only available for download.

UPDATE Guide for Building and Classing Gravity-Based Offshore LNG Terminals, June 2010 (Pub 106)
This updated Guide describes the criteria to be used for gravity-based offshore LNG terminals which are to be classed or certified by ABS. The effective date of this Guide is 1 June 2010. This publication is only available for download.

UPDATE Guide for Dynamic Loading Approach for Floating Production, Storage and Offloading (FPSO) Installations, May 2010 (Pub 101)
This updated Guide provides information about the optional ABS classification notation, Dynamic Loading Approach (DLA), which is available to qualifying ship-type floating production installations (FSOs and FPSOs). The Guide represents the most current and advanced ABS DLA analysis procedure including linear and nonlinear seakeeping analysis. This publication is only available for download.

UPDATE Guide for Spectral-Based Fatigue Analysis for Floating Production, Storage and Offloading (FPSO) Installations, May 2010 (Pub 104)
This updated Guide provides information on the method to perform spectral fatigue analysis for ship-type floating production installations (FSOs and FPSOs). Spectral fatigue analysis performed for FPSOs in accordance with the procedures and criteria in this Guide will be identified in the ABS Record by the notation SFA. This publication is only available for download.
In 2010, nearly 100 industry seminars have been scheduled by ABS covering issues from the wide spectrum of environmental topics, to the regulatory requirements that affect operators sailing into US waters, life cycle management of a vessel or the latest developments in the Arctic.

Usually conducted as either half-day or one-day sessions, the ABS seminar format offers shipowners, managers, designers, builders and others with an interest in the topics, an opportunity to stay abreast on pressing issues without significant time or cost commitments (the seminars are free of charge). With many of the seminars being offered on a cyclical basis, attendees can expect frequent updates on the topics that hold the greatest significance to them.

“We work hard to keep our material up-to-date,” says Kirsi Tikka, Vice President, Global Technology and Business Development. “The Environmental Updates seminar we hold in Yokohama in December, for example, will not be a repeat of the same seminar we held this February in New Orleans. The regulatory and technical environment is much too dynamic for that. We need to stay abreast with the latest developments and then try to present these to our clients in a practical way that focuses on what the changes will mean to their activities.”

Designed to be educational yet casual, the seminars are meant to stimulate open discussion among the panelists and

Bret Montaruli, ABS Vice President of Offshore Technology presents at the Challenges in Arctic Marine & Offshore Operations seminar in Busan.
Audience. Many include speakers from a manufacturer or regulatory authority appropriate to the topic. Representatives of the United States Coast Guard, for example, routinely participate in the Trading in the US Waters seminars held globally.

“There are so many commercial conferences available now,” says Tikka. “But they are often unfocused as they tend to cover a range of topics and the open door nature means that many don’t get into the type of detailed technical discussion we offer. Our goal is simply to help our clients gain a better understanding of how they can cope with the technical issues and challenges that keep arising.”

Participants were informed of the latest regulatory requirements and technical solutions for issues such as fuel switching and ballast water treatment during a recent Environmental Updates seminar in Jakarta.
ICE CLASS FOR GOVERNMENT VESSELS

Training Course Brings Together Two Specialties

Developed with input and guidance from the American Society of Naval Engineers (ASNE) and BMT Technology, the Ice Class for Government Vessels training course offered by ABS Academy provides insight into the state-of-the-art low temperature environment technologies, design assessment procedures, regulatory requirements and other issues government vessels operating in ice conditions will encounter.

“Increased maritime activity in polar regions has prompted the need for greater presence by the US Navy, US Coast Guard and other government agencies,” says Roger Basu, ABS Director of Shared Technology who leads the society’s Arctic initiatives. “This course was designed to inform operators of these often specialized vessels of the wide spectrum of issues they will need to consider,” he adds.

Accredited by the Society of Naval Architects and Marine Engineers (SNAME) as contributing to Professional Engineers Development Hours, participants are exposed to the latest industry developments in hull form and propulsion system design, ship and ice interactions, ice load calculation capabilities and low temperature operational considerations such as navigation approaches, speeds, maneuvering and escorts in addition to the regulatory environment governing these waters.

Participants at the course held recently in the Washington DC area, bottom row, from left: Neil Meister, USCG; James Chambers, Converteam, Inc.; James McCarthy, USCG; Timothy McAllister, USCG; Marcus Ewardo, USCG Marine Safety Center; Shaun Hunter, DRS Defense Solutions, LLC; Roger Basu, ABS; Stan Kulsa, Todd Pacific Shipyards Corp.; and Han Yu, ABS.

Seated in the second row: Claude Daley, BMT Technology; and Andrew Kendrick, BMT Technology.

Third row: Paul Glandt, Wartsila North America Inc.; Michael Davanzo, USCG; Robert Vliesies, Marinette Marine Corporation, Kelly Cox, Booz Allen Hamilton; Oscar Lisagor, Robert Allan Ltd.; Barry McCulloch; USS PORTER (DDG 78); Gene Joelson, Converteam Canada Inc.; Enrico Olivo, Italian Navy; Alan Rechel, USCG APO; and Scott Henry, CSC Advanced Marine.

Back row: Ming Ma, DRS Defense Solutions, LLC; Peter Zahn, Computer Sciences Corporation; Greg Stancilik, USCG; Ian Grunther, USCG; Brian Perkins, USCG; Ray Nancoz, BMT Designers & Planners, Inc.; Scott Lundwall, EIS; Robert Mitchell, Naval Surface Warfare Center; Charlv van Wyk, Converteam Inc.; Jean Lavallee, DRS Technologies Canada Ltd., Ed Downey, Downey Engineering Corp.; Jonathan Hulsizer, Converteam Inc., Philip Leung, Gas TOPS Ltd.; and Douglas Lloyd, HQDA.


Roger Basu
The ABS Academy in Houston, Texas recently held a private training course for Sempra LNG, a subsidiary of Sempra Energy that operates LNG terminals in Baja California, Mexico and Lake Charles, Louisiana in the United States.

Tom Fontana, Director of Marine Operations for Sempra LNG explained that he was looking for a course that provided both an overview of the vetting process for LNG carriers as well as specific information that could improve their inspection reporting, planning and preparations. “There was a different level of familiarity with the vetting process among my team,” said Fontana. “This course provided the entire team with a baseline of knowledge that will enable us to better prepare for future vetting inspections.”

Of particular interest to Fontana’s team were the requirements of the Ship Inspection Report (SIRE) Program, which were covered in detail during the course. The course also outlined the self-assessment requirements which will enable Fontana and his team to make fair and accurate reports in advance of onsite inspections.

“The course was absolutely superb,” said Fontana. “Everyone received a lot of pertinent information and we plan to utilize ABS Academy for future training,” he added.

The vetting inspection course is one of many training programs focused on LNG carriers and terminals offered by the ABS Academy. Operators can also schedule customized courses including new ship construction, ship and terminal interaction, seafarer training on SIGTTO standards, hull inspections and commercial aspects.

Sempra LNG Comes to ABS Academy for Vetting Inspection Training

Client Calls Course “Absolutely Superb”

About the Course

Highlights:

- Introduction to vetting, definitions and background
- Ship Inspection Report (SIRE) Program
- Goals and interests of shipowning/ship management companies
- Interests of major oil and gas companies
- Minimum safety criteria
- Standard procedures to apply for a vetting inspection
- Itemized standard process for a vetting inspection
- Points of attention
- Observations of high-risk
- Review and response to noted observations
- Outline of self-assessment requirements

Who should attend?
Ship and shore-based staff with an involvement in LNG ship vetting inspections. This course meets the requirements of the Royal Institution of Naval Architects and the Institute of Marine Engineering, Science and Technology for continuous Professional Development.

To schedule a course:
Request a session or find out more information on the ABS Academy website, www.absacademy.org. Navigate to the Schedule and select the ‘Vetting Inspections for LNG Vessels’ course.
ABS Members

ABS Membership Plaques

Eng Aik Meng, President of APL Company Pte Ltd. receives an ABS membership plaque from Mark A. McGrath, ABS Pacific Division President and COO.

Thomas H. Gilmour, ABS Americas Division President and COO presents an ABS membership plaque to Antonio Augusto De Queiroz Galvão, General Director of Queiroz Galvão Óleo e Gás S.A.

Kevin Graney, Vice President of Programs, GD/NASSCO, San Diego receives an ABS membership plaque from John Linster, ABS Western District Manager, Americas Division.

Molly Mok, Chairman of Evergreen Marine (Singapore) Pte Ltd. receives an ABS membership plaque from Mark A. McGrath, ABS Pacific Division President and COO.

Mark A. McGrath, ABS Pacific Division President and COO presents an ABS membership plaque to Saburo Koide, President, Daiichi Chuo Kisen Kaisha.

Jose C. Ferreira, ABS Regional Vice President, South America presents an ABS membership plaque to Felipe Simian Fernandez, General Manager of Naviera Chilena Del Pacifico S.A.
Akimitsu Ashida, President, Mitsui OSK Lines (third from left) and Kenichi Yokota, Managing Director, Mitsui OSK Lines (third from right) receive ABS membership plaques from (left) Hitoshi Matsumoto, ABS Country Manager for Japan; Stephen Auger, ABS Regional Vice President, Northern Pacific; Mark A. McGrath, ABS Pacific Division President and COO; and Ken Okabayashi, ABS Business Director for Japan.

Yasuo Tanaka, Director, Nippon Yusen Kaisha (NYK) receives an ABS membership plaque from Mark A. McGrath, ABS Pacific Division President and COO.

Karel Van Campenhout, ABS Senior Vice President, Europe Division presents an ABS membership plaque to Bob Rietveidt, Managing Director, Ulstein Sea of Solutions while Pim Van Tatenhove, ABS Country Manager, Netherlands looks on.

Thomas H. Gilmour, ABS Americas Division President and COO presents an ABS membership plaque to Michael J. Dowdy, Vice President, Engineering, Rowan Companies, Inc.

Mark A. McGrath, ABS Pacific Division President and COO presents an ABS membership plaque to Kenjiro Takenaga, Executive Officer, Kawasaki Kisen Kaisha Ltd. (K-Line).
Preparing a New Generation

Addressing the graduating class of Webb Institute in their final semester of courses, ABS President and COO Christopher J. Wiernicki gave them a glimpse of what they could expect in the maritime industry as they embark on Life After Webb. Part of the Senior Seminar program at the Institute, the presentation provided a look at world shipping and shipbuilding and gave an overview of two issues currently challenging the industry – the environment and energy efficiency.

Webb Institute is a unique undergraduate institution offering a single academic option, a double major in naval architecture and marine engineering. It is the only full-tuition scholarship private undergraduate program of its kind in the United States. As part of the curriculum, the Senior Seminar at Webb often requests members of the maritime industry to introduce students to the human factors, business considerations, management techniques and analytical concepts which they may expect to encounter after graduation.

“I am honored to have had the opportunity to participate in this year’s seminar program,” says Wiernicki, who sits on the Board of Trustees for the Institute. “These young graduates are entering the maritime industry at the most interesting of times. Technological advances allow us to design, build, operate, survey and scrap ships in ways not previously considered.”
ABS Establishes New Scholarship Program in Japan

First Recipients Receive Awards for the University of Tokyo

Under a newly established ABS scholarship program, Japanese students seeking a maritime career may be eligible to receive funds of 50,000 Japanese Yen per month to support their studies. Scholarship winners are selected based upon recommendations received from the students’ selected university. For its inaugural year, the 2010 recipients were Tomoya Nishida and Takuya Shiosawa, who will be undergoing graduate studies at the University of Tokyo, Graduate School of Frontier Sciences, Department of Ocean Technology, Policy and Environment.

For many years, ABS has also sponsored the University of Tokyo, School of Engineering’s Best Thesis Award and was honored to present the award to two recipients in 2010, Takero Yoshida, Department of Ocean Technology, Policy and Environment and Keiji Fujibayashi, Department of Mechanical and Biofunctional Systems. Winners of the award are selected by the university staff based on the quality and potential future impact of the work presented.

ABS’ Seah Named Chairman of IACS Environmental Group

The International Association of Classification Societies (IACS) has selected Ah Kuan Seah, ABS Vice President of Technology and Business Development, Southern Pacific Region to chair its Expert Group focusing on the environment. “The work of the IACS Expert Group/Environment is closely aligned with the environmental mission and initiatives being undertaken by ABS,” says Seah. “I look forward to the challenge of placing the IACS position on environmental issues into the discussions that will lead to new regulations for the shipping industry.”

Ah Kuan Seah
Global Management Changes

New Positions Focus on Technology and Business Development

Sean Bond has moved to the newly created position of Director, Corporate Marine Technology. From London, Bond will continue to bolster ABS’ knowledge in the latest marine trends including LNG, CNG and FLNG technology development. Replacing Bond in his role as Director, Technology and Business Development, Europe Division will be David Davenport Jones. Jones will keep ABS customers in Europe abreast of the latest products and services available from ABS while soliciting their suggestions for the society’s future technology developments.

Brad Achorn, formerly ABS Country Manager for Denmark has been appointed as the Regional Vice President for Nautical Systems based in Piraeus. A veteran of ABS for 13 years, Achorn will be responsible for business development and planning, client implementations and overseeing the efforts of the account management and consulting teams for Nautical Systems in Europe. Frank Jacobsen will assume the duties of ABS Country Manager for Denmark.

ADDRESS CHANGES

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Fax: 58-212-959-8996
Email: ABSCaracas@eagle.org
### ABS Events and Conferences Calendar

**24 – 27 August 2010**  
*Offshore Northern Seas 2010*  
Stavanger, Norway  
Stand: 1178  
www.ons.no

**7 – 10 September 2010**  
*Shipbuilding, Machinery & Marine Technology*  
Hamburg, Germany  
Stand: B3.EG / 311  
www.hamburg-messe.de/smm

**8 – 9 September 2010**  
*Marine Coatings Conference*  
Hamburg, Germany  
ABS Presenter: Ed Jansen  
www.marinecoatingsconference.com

**13 – 14 September 2010**  
*Intertanko Latin American Panel Meeting*  
Lima, Peru  
ABS Presenter: Adam Moilanen  
www.intertanko.com

**13 – 15 September 2010**  
*Canadian Ferry Operators’ Association Annual General Meeting & Conference*  
Halifax, NS, Canada  
Sponsored by ABS, Booth: 4  
ABS Presenter: Bill Lind  
www.cfoa.ca

**13 – 16 September 2010**  
*Rio Oil & Gas Conference*  
Rio de Janeiro, Brazil  
Stand: Q3 - Pavilion 4  
www.ibp.org.br

**14 September 2010**  
*Euromed Management Maritime Forum*  
Marseille, France  
ABS Panelist: Todd Grove  
www.mareforum.com

**14 – 15 September 2010**  
*Fleet Maintenance & Modernization Symposium*  
Virginia Beach, VA, US  
Booth: 202-203  
www.asne-tw.org/asne/FMMS10

**15 September 2010**  
*ICS International Shipping Conference*  
London, UK  
ABS Presenter: Kirsi Tikka  
www.marisec.org/icsconference

**19 – 24 September 2010**  
*International Symposium on Practical Design of Ships & Other Floating Structures*  
Rio de Janeiro, Brazil  
Sponsored by ABS  
Keynote Speaker: Donald Liu  
www.prads2010.org.br

**20 – 23 September 2010**  
*ICETECH*  
Anchorage, AK, US  
Sponsored by ABS  
ABS Presenters: John Dolny, Han-Chang Yu & Bo Wang  
www.icetech10.org

**21 – 22 September 2010**  
*International Forum on Development of Ocean Engineering*  
Shanghai, China  
ABS Presenter: William J. Sember  
www.ssname.com.cn

**22 – 23 September 2010**  
*Marine CNG Transport & Development Forum*  
London, UK  
ABS Presenter: Sean Bond  
www.informaglobalevents.com

**23 – 24 September 2010**  
*Global Greenship Conference & Expo*  
Washington, DC, US  
Sponsored by ABS  
ABS Presenter: Yoshi Ozaki  
www.marinelog.com/DOCS/Conf.html

**24 – 25 September 2010**  
*Ballast Water Treatment Technology Conference*  
London, UK  
ABS Presenter: Charles Dorchak  
www.rivieramm.com

**27 – 29 September 2010**  
*Shipping China 2010*  
Beijing, China  
Sponsored by ABS  
www.rhstevents.com

**28 – 29 September 2010**  
*Marine Machinery Association Fall Meeting*  
New Orleans, LA, US  
ABS Presenter: Rich Delpizzo  
www.marmach.org

**29 Sept. – 1 Oct. 2010**  
*International WISTA Conference*  
Athens, Greece  
Sponsored by ABS  
www.wistaconference.org
4 October 2010
Iron Ore & Coal World Shipping Summit
Athens, Greece
ABS Panelist: Christopher J. Wiernicki
www.mareforum.com

5 October 2010
Salute to the United States Coast Guard
New York, NY, US
Sponsored by ABS
www.cgfdn.org

6 October 2010
Greek Shipping Summit
Athens, Greece
Sponsored by ABS
ABS Presenter: Christopher J. Wiernicki
www.greekshippingsummit.com

11 – 12 October 2010
Asia Maritime & Logistics Conference and Exhibition (AMLCE)
Kuala Lumpur, Malaysia
ABS Presenter: Ah Kuan Seah
www.asiamaritimelogistics.com

12 – 13 October 2010
Dynamic Positioning Conference
Galveston, TX, US
ABS Presenter: George Reilly
www.dynamic-positioning.com

12 – 13 October 2010
Management of Ships’ Waste
London, UK
ABS Presenter: David Jones
www.informaglobalevents.com/event/shipswaste

12 – 14 October 2010
Technology of Oil & Gas Forum
Tripoli, Libya
Stand: 1
www.libyatog.com

12 – 14 October 2010
Offshore Middle East 2010
Doha, Qatar
Sponsored by ABS
www.offshoremiddleeast.com

18 – 22 October 2010
International Symposium on Maritime & Offshore Structures
Tianjin, China
ABS Presenter: Jer-Fang Wu
www.tju.edu.cn

20 – 22 October 2010
Sustainable Shipping
Miami, FL, US
Sponsored by ABS
ABS Presenter: Kirsi Tikka
www.sustainablesshipping.com

25 October 2010
Seateade Middle East & Indian Subcontinent Awards
Dubai, UAE
Sponsored by ABS
ABS Presenter: Todd Grove
www.seatead-middleeast.com

26 – 28 October 2010
Seateade Middle East Maritime
Dubai, UAE
Sponsored by ABS
ABS Panelist: Todd Grove
www.seatrade-middleeast.com

3 – 5 November 2010
SNAME Annual Meeting & Expo
Bellevue, WA, US
Booth: 304
www.sname.org/SNAME/AM

9 November 2010
Turkish Shipping Summit
Istanbul, Turkey
Sponsored by ABS
www.turkishshippingsummit.com

9 – 10 November 2010
Ferries 2010 Conference & Expo
Seattle, WA, US
Sponsored by ABS
www.marinelog.com

9 – 10 November 2010
FLNG Asia Pacific Summit
Seoul, Korea
ABS Presenter: Harish Patel
www.flngsummit.com

14 – 17 November 2010
ISOPE Pacific/Asia Offshore Mechanics Symposium
Busan, Korea
ABS Panelist: Han Yu
www.isope.org

15 – 16 November 2010
Arctic Shipping North America
Montreal, QC, Canada
ABS Presenter: John Dolny
www.informaglobalevents.com/event/arcticshippingnorthamerica

18 – 20 November 2010
Pacific Marine Expo
Seattle, WA, US
Booth: 811
www.pacificmarineexpo.com

30 November 2010
President’s Invitation Lecture & Dinner
London, UK
Sponsored by ABS
www.rina.org.uk/presidentsinvitation2010
Newly Classed Vessels and Recent Contracts

ETHEL L, a 34,399 dwt bulk carrier, BC-A, AB-CM, CSR, GRAB, TCM, GP, built by SPP Shipbuilding for Two Navigation.

1 April to 30 June 2010
## Newly Classed Vessels and Facilities

### TANKERS

<table>
<thead>
<tr>
<th>Vessel Name</th>
<th>GT / DWT</th>
<th>Classification</th>
<th>Builder</th>
<th>Owner/Shipowner</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALPINE LINK</td>
<td>29,826 / 34,997</td>
<td>AB-CM, RES, CSR, VEC-L, TCM</td>
<td>SPP Shipbuilding for Apollo Shipowning</td>
<td></td>
</tr>
<tr>
<td>ALTHEA</td>
<td>5,046 / 6,333</td>
<td></td>
<td>CSC Chongqing Dong Feng Shipbuilding for Africa Maritime</td>
<td></td>
</tr>
<tr>
<td>ARAMON</td>
<td>42,225 / 74,060</td>
<td>AB-CM, CSR, RES, VEC-L, TCM</td>
<td>SPP Plant &amp; Shipbuilding for Aramon</td>
<td></td>
</tr>
<tr>
<td>BHAIRAVI</td>
<td>8,625 / 13,140</td>
<td>VEC</td>
<td>Sekwang H I for SCI Forbes</td>
<td></td>
</tr>
<tr>
<td>BW ZAMBESI</td>
<td>43,797 / 76,578</td>
<td>SH, VEC, TCM</td>
<td>Dalian Shipbuilding Industry for BW Fleet Management</td>
<td></td>
</tr>
<tr>
<td>CAPE DALY</td>
<td>8,278 / 12,755</td>
<td>VEC</td>
<td>STX Offshore &amp; Shipbuilding for Rio Daly Schiffahrt</td>
<td></td>
</tr>
<tr>
<td>CAPE DAWSON</td>
<td>8,278 / 12,789</td>
<td>VEC</td>
<td>STX Offshore &amp; Shipbuilding for Rio Dawson Schiffahrt</td>
<td></td>
</tr>
<tr>
<td>CELTIC SEA</td>
<td>59,180 / 115,123</td>
<td>SH, SHCM, VEC-L, GP</td>
<td>Sasebo H I for Dezlol Shipping</td>
<td></td>
</tr>
<tr>
<td>D T MARIANO, D T VINCENZO P</td>
<td>60,193 / 109,010</td>
<td>SH, SHCM, VEC, TCM</td>
<td>Hudong-Zhonghua Shipbuilding for Dolphin Tanker</td>
<td></td>
</tr>
<tr>
<td>ERIN SCHULTE</td>
<td>11,233 / 16,716</td>
<td>ES, ECM, TCM</td>
<td>Jiangxi Jiangzhou Union Shipbuilding for Dorchester LNG</td>
<td></td>
</tr>
<tr>
<td>FANTASIA</td>
<td>29,614 / 51,434</td>
<td>SHR, SHCM, RES, FL30, Ice Class “IB”, VEC</td>
<td>SLS Shipbuilding for Mornini</td>
<td></td>
</tr>
<tr>
<td>FPMC 19</td>
<td>30,174 / 46,851</td>
<td>AB-CM, CSR</td>
<td>Jinling Shipyard for FPMC Brick Marine</td>
<td></td>
</tr>
<tr>
<td>FPMC 21</td>
<td>29,734 / 51,105</td>
<td>AB-CM, CSR, VEC</td>
<td>STX Offshore &amp; Shipbuilding for FPMC Glory Marine</td>
<td></td>
</tr>
<tr>
<td>FRATERNITY</td>
<td>81,427 / 157,714</td>
<td>AB-CM, CSR, VEC-L, TCM</td>
<td>Samsung H I for Europa V Ship Management</td>
<td></td>
</tr>
<tr>
<td>GREAT CHINA</td>
<td>156,651 / 297,168</td>
<td>SH, SHCM, VEC</td>
<td>Shanghai Jiangnan-Changxing Shipbuilding for Great China Maritime</td>
<td></td>
</tr>
<tr>
<td>HACI TELLI</td>
<td>1,949 / 2,818</td>
<td></td>
<td>Sahin Celik Shipyard for Teiller Denizcilik Ve Ticaret</td>
<td></td>
</tr>
<tr>
<td>HELLESPONT CHARGER</td>
<td>11,551 / 16,802</td>
<td>DWT, VEC-L,</td>
<td>SPP Shipbuilding for Mt Hellespont Charger</td>
<td></td>
</tr>
<tr>
<td>KAROLOS</td>
<td>85,362 / 149,991</td>
<td>AB-CM, CSR, VEC-L, TCM</td>
<td>New Times Shipbuilding for Intergrade</td>
<td></td>
</tr>
<tr>
<td>METEORA</td>
<td>25,400 / 40,048</td>
<td>SH, SHCM, RES, PORT, VEC, TCM</td>
<td>SLS Shipbuilding for Mornini</td>
<td></td>
</tr>
<tr>
<td>MYRTOS</td>
<td>58,418 / 106,969</td>
<td>SH, AB-CM, RES, VEC</td>
<td>Shanghai Waigaqiao Shipbuilding for Firebird Navigation</td>
<td></td>
</tr>
<tr>
<td>NAVIGATOR</td>
<td>3,978 / 5,991</td>
<td>VEC</td>
<td>Qingdao Hyundai Shipbuilding for Navigator Worldwide</td>
<td></td>
</tr>
<tr>
<td>NEW PARADISE</td>
<td>156,921 / 297,863</td>
<td>SH, VEC</td>
<td>Universal Shipbuilding for New Paradise Shipping</td>
<td></td>
</tr>
<tr>
<td>NORD IMAGINATION</td>
<td>28,777 / 34,996</td>
<td>SH, VEC</td>
<td>Iwagi Zosen for El Barrio Shipping</td>
<td></td>
</tr>
<tr>
<td>NORDISLE, NORDOCEAN</td>
<td>8,278 / 12,823</td>
<td>VEC</td>
<td>STX Offshore &amp; Shipbuilding for MPC Luennmeyner Petersen Steamship</td>
<td></td>
</tr>
<tr>
<td>OCEAN WINTER</td>
<td>27,987 / 41,370</td>
<td>SH, SHCM, RES, FL(30), VEC, GP</td>
<td>SLS Shipbuilding for Xin Ying Shipping</td>
<td></td>
</tr>
</tbody>
</table>

*BW ZAMBESI, a 76,578 dwt tanker, SH, VEC, TCM, built by Dalian Shipbuilding Industry for BW Fleet Management.*

*CAPE DALY, a 12,755 dwt tanker, VEC, built by STX Offshore & Shipbuilding for Rio Daly Schiffahrt.*

*MYRTOS, a 106,969 dwt tanker, SH, AB-CM, RES, VEC, built by Shanghai Waigaqiao Shipbuilding for Firebird Navigation.*
ORKIM POWER, 5,081 gt / 7,370 dwt, built by Jiujiang Yin-Xing Shipyard for Orkim Power
OVERSEAS CASCADE, 29,234 gt / 46,287 dwt, AB-CM, ES, VEC, built by Aker Philadelphia Shipyard for Overseas St. Holding
OVERSEAS SKOPELOS, 29,826 gt / 50,222 dwt, AB-CM, RES, CSR, VEC-L, TCM, built by SPP Plant & Shipbuilding for Skopelos Product Tanker
SANKO QUEEN, 160,102 gt / 309,741 dwt, SH, SHCM, VEC, built by Imabari Shipbuilding for Southern Route Maritime
SCF SURGUT, 81,339 gt / 158,097 dwt, AB-CM, CSR, NIBS, VEC, TCM, built by Hyundai for Gatson Shipping
SEMUJA PERKASA, 8,539 gt / 13,053 dwt, VEC, built by 21st Century Shipbuilding for NFC Labuan Shipleasing I
STAR SIRIUS, 1,306 gt / 1,875 dwt, built by Keppel Batangas Shipyard for Batangas Bay Carriers
SUNSHINE STATE, 29,527 gt / 48,569 dwt, SH, SHCM, FL 25, VEC, built by NASSCO for Apt Sunshine State
TATAKI, 85,362 gt / 149,992 dwt, AB-CM, CSR, VEC-L, TCM, built by New Times Shipbuilding for Equitrust
V8 STEALTH, 62,775 gt / 112,871 dwt, AB-CM, CSR, ES, VEC, TCM, built by New Times Shipbuilding for Mayhem Crude
VADELA, 83,545 gt / 156,183 dwt, AB-CM, CSR, RES, NIBS, VEC-L, TCM, built by Jiangsu Rongsheng H I for Ligaria Owning
VALBRENTA, VALPIAVE, 60,185 gt / 109,039 dwt, SH, SHCM, VEC, built by Hudong-Zhonghua Shipbuilding for Navigazione Montanari
YANGTZE FOUNTAIN, 156,702 gt / 297,580 dwt, SH, SHCM, VEC, built by Shanghai Jiangnan-Changxing Shipbuilding for Betelgeuse Shipping
ZOUZOU N, 85,362 gt / 149,997 dwt, AB-CM, CSR, VEC-L, TCM, built by New Times Shipbuilding for Finaco Trade & Investment

BULK CARRIERS

AQUAPRINCESS, 93,360 gt / 182,060 dwt, BC-A, AB-CM, CSR, GRAB, TCM, built by Odense Steel Shipyard for Freeway Steamship
BENEDETTA D’AMATO, 53,722 gt / 93,200 dwt, BC-A, AB-CM, CSR, GRAB, built by Jiangsu New Yangzi Shipbuilding for Fertilia
CAPTAIN VANGELIS K, 88,420 gt / 169,044 dwt, BC-A, AB-CM, CSR, GRAB, TCM, GP, built by Sungdong Shipbuilding & Marine Engineering for Prideship
CHANCHAL PREM, 51,255 gt / 93,259 dwt, BC-A, AB-CM, CSR, GRAB, PORT, TCM, built by Jiangsu New Yangzi Shipbuilding for Liberty Maritime International
CLIPPER ICHIBAN, 17,009 gt / 28,319 dwt, BC-A, SHR, GRAB, built by I-S Shipyard for La Darien Navegacion
CLIPPER TALENT, 19,972 gt / 30,475 dwt, BC-A, AB-CM, CSR, GRAB, TCM, built by Tsuji H I for T-Trader Seven
CLIPPER TARPON, 19,972 gt / 30,428 dwt, BC-A, AB-CM, CSR, GRAB, TCM, built by Tsuji H I for T-Trader Nine
CS CAROLINE, 19,972 gt / 30,420 dwt, BC-A, AB-CM, CSR, GRAB, TCM, built by Tsuji H I for Campbell Shipping
EAST SUNRISE 88, 51,255 gt / 93,193 dwt, BC-A, AB-CM, CSR, GRAB, built by Jiangsu New Yangzi Shipbuilding for East Sunrise Shipping
ETHEL L, 23,400 gt / 34,399 dwt, BC-A, AB-CM, CSR, GRAB, TCM, GP, built by SPP Shipbuilding for Two Navigation
FEG SUCCESS, 93,104 gt / 182,619 dwt, BC-A, AB-CM, CSR, GRAB, built by Kawasaki Shipbuilding for Cape 4 International
FIVE STARS FUJIAN, 93,385 gt / 181,383 dwt, BC-A, AB-CM, CSR, GRAB, TCM, built by Sasebo H I for Five Stars Fujian Shipping
GEMINI S, 40,170 gt / 75,206 dwt, BC-A, SH, AB-CM, GRAB, TCM, built by Hudong-Zhonghua Shipbuilding for Anangel Maritime
JIN JUN, 33,036 gt / 56,887 dwt, BC-A, AB-CM, CSR, GRAB, TCM, built by Shanghai Shipyard for Jinjun Marine
JIN MAO, 30,638 gt / 54,768 dwt, BC-A, SHR, built by Oshima Shipbuilding for Jinmao Marine
MONEMVASIA, 91,373 gt / 177,933 dwt, BC-A, SH, SHCM, GRAB, built by Shanghai Jiangnan-Changxing Shipbuilding for Tumac
NAVIOS ANTARES, 88,421 gt / 169,053 dwt, BC-A, AB-CM, GRAB, CSR, TCM, GP, built by Sungdong Shipbuilding & Marine Engineering for Rumer Holdings
NAVIOS AURORA II, 88,421 gt / 169,031 dwt, BC-A, AB-CM, CSR, GRAB, TCM, GP, built by Sungdong Shipbuilding & Marine Engineering for Chilali
NAVIOS LUMEN, 94,817 gt / 180,661 dwt, BC-A, AB-CM, CSR, TCM, built by STX Offshore & Shipbuilding for Pueblo Holdings
NAVIOS STELLAR, 88,421 gt / 169,001 dwt, BC-A, AB-CM, CSR, GP, GRAB, TCM, built by Sungdong Shipbuilding & Marine Engineering for Shikhar Ventures
POLESIE, 24,055 gt / 38,069 dwt, BC-A, SHR, Ice Class “IC”, TCM, built by Tianjin Xingang Shipbuilding & Heavy Industry for Ares Nine Shipping
ROBERTO RIZZO, 91,971 gt / 176,189 dwt, BC-A, AB-CM, CSR, GRAB, built by Zhoushan Jinhaiwan Shipbuilding for Rizzo Bottiglieri de Carlini Armatori
SAM EAGLE, 20,846 gt / 32,580 dwt, BC-A, AB-CM, CSR, GRAB, built by Jiangsu Lanbo Shipbuilding for SPV Sam Eagle
STEVEN C, 23,400 gt / 34,340 dwt, BC-A, AB-CM, CSR, GRAB, TCM, GP, built by SPP Shipbuilding for One Navigation
UGO DE CARLINI, 91,971 gt / 165,153 dwt, BC-A, AB-CM, CSR, GRAB, built by Zhoushan Jinhaiwan Shipyard for Rumer Holdings
VESTNES, 19,538 gt / 29,827 dwt, BC-B, SH, SHCM, TCM, built by Yantai CIMC Raffles Offshore for Pelican Waters Investments
ZOSCO JIAXING, 91,971 gt / 175,886 dwt, BC-A, AB-CM, CSR, GRAB, built by Zhoushan Jinhaiwan Shipbuilding for Bright Zhejiang Shipping.

CONTAINERSHIPS

MAERSK WIESBADEN, 1,700 teu, SH, SHCM, built by CSBC for White Laurel Shipping
OOCL CHARLESTON, OOCL DALIAN, OOCL NAGOYA, 4,500 teu, SH, SHCM, built by Samsung H I for Orient Overseas Container Line
OOCL LE HAVRE, 4,500 teu, SH, SHCM, built by Samsung H I for New Container No. 36
OOCL SEOUL, 8,063 teu, SH, SHCM, ES, NIBS, built by Samsung H I for Orient Overseas Container Line
OOCL WASHINGTON, 8,063 teu, SH, SHCM, ES, NIBS, built by Samsung H I for New Container No. 41

GAS CARRIERS

ASEM, 155,003 m³, SH, SH-DLA, SHCM, NIBS, TCM, built by Samsung H I for India LNG Transport
DAPENG STAR, 147,210 m³, SH, SH-DLA, SHCM, FL40, ES2020, NBLES, TCM, built by Hudong-Zhonghua Shipbuilding for China LNG Shipping
KOBAI, 82,000 m³, SH, SHCM, FL30, TC, built by Hyundai H I for Heroic Crater
SHAGRA, 266,000 m³, SH, SH-DLA, SHCM, ES2020, NIBS, TCM, built by Samsung H I for Qatar Gas Transport

SAM EAGLE, a 32,580 dwt bulk carrier, BC-A, AB-CM, CSR, GRAB, built by Jiangsu Lanbo Shipbuilding for SPV Sam Eagle.

OOCL WASHINGTON, an 8,063 teu containership, SH, SHCM, ES, NIBS, built by Samsung H I for New Container No. 41.

SHAGRA, a 266,000 m³ gas carrier, SH, SH-DLA, SHCM, ES2020, NIBS, TCM, built by Samsung H I for Qatar Gas Transport.
## Offshore

**MODUs**

- **Ocean Courage**, 30,923 gt, ØPS-2, CDS, built by Jurong Shipyard for Petro Rig I
- **Ocean Valor**, 30,923 gt, ØPS-2, CDS, built by Jurong Shipyard for Diamond Offshore Drilling
- **West Vencedor**, 15,839 gt, built by Keppel Fels for Seadrill Tender Rig

**Self Elevating Drilling Units**

- **Goliath**, 3,155 gt, built by Iemants for Geosea
- **Greatdrill Chitra**, 9,743 gt, built by Keppel Fels for Greatship Global Energy Services
- **Haiyang Shiyou 936**, 14,423 gt, built by China Merchants H I for Drilling-China Oilfield Services
- **Levek Leader**, 5,097 gt, built by Saigon Shipyard for Ezion Holdings
- **Pico 4**, 2,559 gt, built by Semco for GOS Petroleum Marine
- **Pv Drilling III**, 9,752 gt, built by Keppel Fels for Petrovietnam Drilling Investment
- **Ralph Coffman**, 10,411 gt, CDS, built by Letourneau Technologies for Rowan Luxembourg
- **Sneferu**, 9,985 gt, built by PPL Shipyard for Egyptian Drilling

## Miscellaneous

**Barges**

- 650-8, 13,462 gt, SH, SHCM, built by V T Halter Marine for Vessel Management Services
- **B NO 264**, 4,856 gt, built by Bollinger Marine Fabricators for Bouchard Ocean Services
- **Bassdrill Alpha**, 6,148 gt, built by Lamprell Energy for Bassdrill International
- **Bedukang**, 5,316 gt, built by Pacific Ocean Engineering & Trading for Orchard Maritime Chartering
- **Belanak**, 5,266 gt, built by Nantong Tiannan Shipyard for Orchard Maritime Chartering
- **Bigger**, 4,811 gt, built by Wujian Xinsheng Shipbuilding for Asian Shipping
- **Bina Marine 58**, 3,814 gt, built by P T Marcopolo Shipyard for Marcopolo Shipping
- **Bina Marine 66**, 3,279 gt, built by P T Marcopolo Shipyard for Marcopolo Shipping
- **Bulesko II**, 3,146 gt, built by Jiangsu Ganghua Shipyard for K3 Shipping
- **Ccc Becquet**, 3,105 gt, built by Nanjing Yenghua Shipbuilding for Coastal Carriers
- **Cib 720**, 2,164 gt, built by C & C Marine & Repair for CIBCO Barge Line
- **Crest 300**, 3,924 gt, built by Nantong Tongbao Shipbuilding for Pacific Radiance
- **Crest 2821**, 3,347 gt, built by Taixing Sunhoo Shipbuilding for Pacific Crest
- **Crest Station 2**, 12,532 gt, built by Nantong Tongde Shipyard for Pacific Crest
- **Dbl 54**, 4,276 gt, built by Zidell Marine for K-Sea Transportation Partners
- **Dbl 106**, 7,129 gt, built by Bollinger Marine Fabricators for K-Sea Transportation Partners
- **De Sal 14**, 4,700 gt, built by GMG Shipbuilding & Heavy Industry for Exportadora de Sal
- **Double Skin 506**, 4,238 gt, built by Jeffboat for Vane Line Bunkering
EASTERN ORBIT, 4,921 gt, built by Jiangsu Huatai Shipbuilding for Eastern Navigation

ESP 319, 3,107 gt, built by P T Karya Teknik Utama for P T Ershian Satyapratama

ESP 2707, 2,144 gt, built by P T Karya Teknik Utama for P T Ershian Satyapratama

EWAN VICTORIA, 2,219 gt, built by Jinsheng Ship Manufacture for Ewan Marine

FINACIA 72, 4,259 gt, built by Pacific Marine & Shipbuilding for P T Mitra Bahtera Sagarasejati

FINACIA 73, 4,259 gt, built by Pacific Marine & Shipbuilding for Pacific Marine & Shipbuilding

FINACIA 75, FINACIA 77, 4,131 gt, built by Jinsheng Ship Manufacture for P T Mitra Bahtera Sagarasejati

FRANKLIN 2801, 2,565 gt, built by Paliy Marine Fabricator for Franklin Offshore International

G S L -08, 3,233 gt, built by Yangzhou Hairun Shipping for P T Pelayaran Gema Samudera Lines

GLORY MARINE 1, GLORY MARINE 2, 8,526 gt, built by Jiangsu Huatai Shipbuilding for Harita Berlian Shipping

HA’AHEO, 4,511 gt, built by US Barge for Young Brothers

ILIR JAYA V, 4,075 gt, built by Nantong Yongxing Shipping Services for P T Oni

JASCON 51, 3,190 gt, built by Nantong Tiannan Shipyard for Consolidated Projects

JAYA INSTALLER 7, 10,197 gt, built by Jiangsu Ganghua Shipyard for Jaya Shipbuilding & Engineering

JMC 257, JMC 258, 2,115 gt, built by LAD Services of Louisiana for Cashman Equipment

KALUSUGAN 2, 3,146 gt, built by Nantong Jinjian Shipbuilding & Repair for Inte Marine

KAPUAS JAYA 365, 4,498 gt, built by P T Jasamarin Engineering for P T Kapuas Jaya Samudera

LEIGHTON ECLIPSE, 16,111 gt, built by P T Expert Engineering for Leighton Contractors

LINAU 85, 4,334 gt, built by Shin Yang Shipyard for Shin Yang Shipping

LINTAS SAMUDERA 51, 3,105 gt, built by Nanjing Yonghua Shipbuilding for P T Pelayaran Duta Lintas Samudera

LOCAR V, 2,401 gt, built by Estaleiro Rio Maguari for Locar Transportes Tecnico e Guindastes

MANN 3301, 4,259 gt, built by Nanjing Ding Feng Shipbuilding for Mantro Marine Services

MANNA LINE 812, 4,186 gt, built by Yangzhou Hairun Shipping for Putra Bulian Shipping & Trading

MARIDIVE CONSTRUCTOR, 5,847 gt, built by ABG Shipyard for Valentine Maritime (Gulf)

MARMAC 23, MARMAC 25, 2,152 gt, built by Southwest Shipyard for McDonough Marine Service

MICLYN CONSTRUCTOR 1, 8,508 gt, built by P T Miclyn Shipbuilding & Engineering for Offshore Charters

OEM 3001, OEM 3002, 3,151 gt, built by Taizhou Sanfu Ship Engineering for Ocean Express Marine

OSPREY CARRIER II, 2,125 gt, built by Nantong Tongde Shipyard for Pacific Ocean Engineering & Trading

OSPREY TRADER, 2,365 gt, built by Nantong Tongde Shipyard for Pacific Ocean Engineering & Trading

OTTO 3, 10,413 gt, built by Nantong Hongqiang Marine H I for Koi Marine

PB 3005, PB 3006, 3,146 gt, built by Jinsheng Ship Manufacture for Putra Bulian Shipping & Trading

PRASETYA 9, 3,105 gt, built by Nanjing Yonghua Shipbuilding for P T Pelayaran Duta Lintas Samudera

SCF SURGUT, a 158,097 dwt tanker, AB-CM, CSR, NIBS, VEC, TCM, built by Hyundai for Gatson Shipping.

JIN MAO, a 54,768 dwt bulk carrier, BC-A, SHR, built by Oshima Shipbuilding for Jinmao Marine.
RMN 355, 3,233 gt, built by Yangzhou Hairun Shipping for Putra Bulian Shipping & Trading
RMN 356, RMN 357, 3,231 gt, built by Nanjing Yonghua Shipbuilding for Putra Bulian Shipping & Trading
RMN 358, 3,147 gt, built by Nantong Tongmao Shipbuilding for Putra Bulian Shipping & Trading
RMN 368, 3,145 gt, built by Nanjing East Star Shipbuilding for Putra Bulian Shipping & Trading
ROBBY 303, ROBBY 305, 3,146 gt, built by Jiangsu Taixing Yuemei Shipyard for Menumar Offshore
RTC 85, 5,822 gt, built by Southeastern New England Shipbuilding for Reinauer Transportation
S-7000, 3,105 gt, built by Nanjing Asiapride Shipping Making for Eagle Red
SEADRILL T-12, 10,708 gt, built by Maylaysia Marine & Heavy Engineering for Seadrill Tender Rig
SIGNET ATLAS, 4,169 gt, built by Signal International for Signal International
SIXTY-FIVE ROSES, 6,699 gt, built by US Barge for Harley Marine Services
SK LINE 301, 10,159 gt, built by Fuzhou Xiayang Shipbuilding for Nan Cheong Dockyard
SOEKAWATI-2, 3,140 gt, built by Jiangsu Ganghua Shipyard for P T Pelayaran Borneo Karya Swadiri
SS3308, 4,186 gt, built by Yangzhou Hairun Shipping for Sinosin Sentosa
STATIA HORIZON, 2,391 gt, built by Jeffboat for Seacor Offshore Ocean Barges
TARGETLINE 3455, 4,640 gt, built by Yangzhou Hairun Shipping for Target Shipping
TOLL 3310, TOLL 3339, 4,262 gt, built by Nanjing Yonghua Shipbuilding for Toll Logistics
TONG KAH 3002, 3,233 gt, built by Yangzhou Hairun Shipping for Tong Kah Shipping
WEEKS 184, 4,169 gt, built by Eagle Fabrication for Weeks Marine
WINBUILD 1450, 5,270 gt, built by Pacific Ocean Engineering & Trading for Pacific Ocean Engineering & Trading

**Government Vessels**

BEL M SHIMADA, 2,218 gt, Ice Class “C0”, OPS-1, built by V T Hafer Marine for NOAA Corps Operations

**Tugs, Workboats and OSVs**

AQUAMARINE, 2,428 gt, Fire Fighting Vessel Class 1, OPS-2, built by Universal Shipbuilding for Offshore Gold Shipping
ARMADA TUAH 82, 2,147 gt, Fire Fighting Vessel Class 1, OPS-1, built by Nam Cheong Dockyard for Bumi Armada Navigation
ARMADA TUAH 105, 2,921 gt, Fire Fighting Vessel Class 1, OPS-2, built by P T Drydocks World Pertama for Bumi Armada Navigation
BEAS DOLPHIN, 1,615 gt, built by Alcock Ashdown for Dolphin Offshore Enterprises
BEE STING, 1,596 gt, OPS-2, built by Bollinger Shipyard for Bee Mar
BOURBON INTAN, 1,733 gt, Fire Fighting Vessel Class 1, OPS-2, built by Zhenjiang Shipbuilding for Bourbon Offshore Labuan
BOURBON LIBERTY 115, 1,517 gt, OPS-2, built by Yangzhou Dayang Shipbuilding for Bourbon Liberty 115 SNC
BOURBON LIBERTY 116, 1,517 gt, Fire Fighting Vessel Class 1, OPS-2, built by Yangzhou Dayang Shipbuilding for Bourbon Supply Investissements
BOURBON LIBERTY 213, 1,733 gt, Fire Fighting Vessel Class 1, OPS-2, built by Zhejiang Shipbuilding for Bourbon Supply Investissements
BOURBON LIBERTY 215, 1,733 gt, Fire Fighting Vessel Class 1, DPS-2, built by Yangzhou Dayang Shipbuilding for Bourbon Supply Investissements

BOURBON LIBERTY 216, 1,733 gt, Fire Fighting Vessel Class 1, DPS-2, built by Yangzhou Dayang Shipbuilding for Bourbon Liberty 216 SNC

BOURBON LIBERTY 217, BOURBON LIBERTY 222, 1,733 gt, Fire Fighting Vessel Class 1, DPS-2, built by Zhenjiang Shipbuilding for Bourbon PS Sasu

BOURBON LIBERTY 220, 1,733 gt, Fire Fighting Vessel Class 1, DPS-2, built by Zhenjiang Shipbuilding for Bourbon Supply Asia

CAPTAIN JOHN K, 1,731 gt, Fire Fighting Vessel Class 1, DPS-1, built by P T ASL Shipyard for RK Offshore Management

DEROCHE TIDE, 1,458 gt, Fire Fighting Vessel Class 1, built by Guangzhou Hangtong Shipbuilding for Jaya Shipbuilding & Engineering

D’SOUZA TIDE, 1,678 gt, Fire Fighting Vessel Class 1, DPS-1, built by Fujijsiu Southeast Shipyard for Tidewater Properties

GARZA TIDE, 2,369 gt, Fire Fighting Vessel Class 1, DPS-2, built by Fujian Mawei Shipbuilding for Tidewater Marine

GENIE LAB, 2,287 gt, DPS-2, built by Eastern Shipbuilding for Laborde Marine Services

GSP ALCOR, 1,678 gt, Fire Fighting Vessel Class 1, DPS-1, built by Fujijsiu Southeast Shipyard for Primus Shipping

HADI 25, 1,596 gt, Fire Fighting Vessel Class 1, DPS-2, built by Zhoushan Jinhui Ship Repair for Hadi H Al-Hammam

HADI 27, HADI 28, 1,722 gt, Fire Fighting Vessel Class 1, DPS-2, built by Keppel Singmarine for Hadi H Al-Hammam

HAI YANG SHI YOU 698, 2,921 gt, Fire Fighting Vessel Class 1, DPS-2, built by Fujian Southeast Shipyard for COOEC

HARRIER K, 1,763 gt, Fire Fighting Vessel Class 1, DPS-1, built by Guijiang Shipbuilding for Otto Offshore

HAWK K, 1,763 gt, Fire Fighting Vessel Class 1, DPS-1, built by Guijiang Shipbuilding for Dolfih 3

HOS ARROWHEAD, 2,428 gt, DPS-2, built by Leevac Industries for Hornbeck Offshore Services

HOS SWEET WATERI, 1,934 gt, DPS-2, built by Atlantic Marine Florida for Hornbeck Offshore Services

HUAKANG, 1,706 gt, Fire Fighting Vessel Class 1, DPS-1, built by Fujian Crown Ocean Shipbuilding Industry for Huakang Shipping

HUAKUN, 1,960 gt, Fire Fighting Vessel Class 1, DPS-1, built by Jiangsu Zhenjiang Shipyard for Huakun Shipping

IEVOLI BLUE, 2,283 gt, Fire Fighting Vessel Class 1, DPS-1, built by Northern Shipyard Gdansk for Marnavi

INGRID, 2,998 gt, Fire Fighting Vessel Class 1, DPS-2, built by North American Shipbuilding for Island Ventures II

KATHY K, 1,731 gt, Fire Fighting Vessel Class 1, DPS-1, built by P T ASL Shipyard for RK Offshore Management

KPV KAPAS, 1,704 gt, Fire Fighting Vessel Class 1, built by Nam Cheong Dockyard for Teras Muhibbah

LEESE TIDE, 2,369 gt, Fire Fighting Vessel Class 1, DPS-2, built by Fujian Mawei Shipbuilding for Tidewater Marine

MERMAID ASIANA, 5,955 gt, DPS-2, built by ASL Shipyard for Nemo Subsea

MERMAID SAPPHIRE, 2,077 gt, DPS-2, built by P T Jaya Asiatic Shipyard for Mermaid Offshore Services

MERMAID VANTAGE, 1,678 gt, Fire Fighting Vessel Class 1, DPS-1, built by Fujian Southeast Shipyard for Mermaid Asia

MERMAID VIGILANCE, 2,418 gt, Fire Fighting Vessel Class 1, DPS-2, built by Jingjiang Nanyang Shipbuilding for Mermaid Marine

OCEAN SAPPHIRE, 2,921 gt, Fire Fighting Vessel Class 1, DPS-2, built by Jingjiang Nanyang Shipbuilding for Samson Maritime
O’ROURKE TIDE, 1,370 gt, Fire Fighting Vessel Class 1, built by Yuexin Shipbuilding for VTG Ships
PACIFIC GAS, 1,623 gt, Fire Fighting Vessel Class 1, Safety Standby Service GR, C(6), DPS-1, built by PRM Offshore H I for Natuna Richfield Marine
PACIFIC VALOUR, 2,147 gt, built by P T Nan Indah Mutiara Shipyard for Swire Pacific Offshore Services
PETRA EXPEDITION, 2,532 gt, Fire Fighting Vessel Class 1, DPS-2, built by Fujian Crown Ocean Shipbuilding for Mount Santubong
PTSC HA NOI, 1,712 gt, Fire Fighting Vessel Class 1, DPS-1, built by P T Marcopolo Shipyard for Asia Investment & Asset Management
SANKO CROCUS, 2,465 gt, Fire Fighting Vessel Class 1, DPS-2, built by Niigata Shipbuilding & Repair for Crocus Offshore
SANTOS SAILOR, SANTOS SUPPORTER, 2,999 gt, Fire Fighting Vessel Class 1, DPS-2, built by Estaleiro Navship for Bram Offshore Transportes Maritimos
SEA HAWK 1, 2,952 gt, Fire Fighting Vessel Class 1, DPS-2, built by Jaya Shipbuilding & Engineering for JSE Shipping
SETIA ULUNG, 3,404 gt, Fire Fighting Capability, built by Nantong Tongbao Shipbuilding for Aiam-Pe IV
SK LINE 402, 3,256 gt, built by Fuzhou Liya Shipping Engineering for Nam Cheong Dockyard
SWIBER ANNE-CHRISTINE, 2,708 gt, Fire Fighting Vessel Class 1, DPS-2, built by Fujian Southeast Shipyard for Bukit Timah Offshore
TAG-8, 2,369 gt, Fire Fighting Vessel Class 1, DPS-1, built by Fujian Mawei Shipbuilding for Tag Offshore
TERREL TIDE, 2,326 gt, Fire Fighting Vessel Class 1, DPS-2, built by Quality Shipyard for Tidewater Marine
VOS HERA, 1,678 gt, Fire Fighting Vessel Class 1, built by Fujian Southeast Shipyard for Offshore Support Vessel 10
VOS HIPPO, 1,678 gt, Fire Fighting Vessel Class 1, DPS-1, built by Fujian Southeast Shipyard for Offshore Support Vessel 10
VRANA TIDE, 1,370 gt, Fire Fighting Vessel Class 1, built by Yuexin Shipbuilding for Tidewater Marine
VUNG TAU 02, 2,342 gt, Fire Fighting Vessel Class 1, DPS-2, built by P T Jaya Asiatic Shipyard for Vietsovpetro Joint Venture
VUNG TAU 03, 2,538 gt, Fire Fighting Vessel Class 1, DPS-1, built by Yuxin Shipbuilding for Vietsovpetro Joint Venture
WATERBUCK, 2,311 gt, Fire Fighting Vessel Class 1, DPS-2, built by Northern Shipyard Gdansk for Chouest Cyprus Marine
ZAMIL 35, 1,211 gt, built by Zhoushan Jinhui Ship Repair for Zamil Offshore Services
ZAMIL 56, 1,574 gt, Fire Fighting Vessel Class 1, DPS-1, built by Zamil Offshore Services for Zamil Offshore Services
ZAMIL 61, 1,330 gt, Fire Fighting Vessel Class 1, DPS-1, built by Cheoy Lee Shipyards for Zamil Offshore Services

**Yachts**

4 YOU, 493 gt, built by Hessen Yacht Builders for Galaxis Maritime
BLIND DATE, 442 gt, built by Trinity Yachts for Lincoln Holdings Cayman
HARMONY, 492 gt, built by Westport Shipyard for Atlantis Harmony
OCEAN DREAM, 299 gt, built by Azimut-Benetti for Future Trillion Enterprises
RED SAPPHIRE, 478 gt, built by Trinity Yachts for Star Ruby Marine
ROMA, 1,090 gt, ES, R-2, built by Viareggio Superyachts for Triton Charters
WESTPORT 40M, 333 gt, built by Westport Shipyard for Westport Shipyard
Z, 422 gt, built by Arno Super Yachts for Royvis

Others
ANTOINETTE, 28 gt, HSC rescue vessel, built by Aluboot for Koninklijke Nederlandse Reddingmaatschappij
ARAMARA, 462 gt, HSC crew boat, built by Strategic Marine Mexico for Arrendadora Ocean Mexicana
BOURBON ADELAIDE, 355 gt, HSC crew boat, built by Grandweld for Bourbon Supply Investissements
CHOIQUE, 121 gt, HSC launch, built by Detroit Chile for Remolcadores Ultratug
ESNAAD 810, 544 gt, HSC crew boat, built by Penguin Shipyard International for Abu Dhabi National Oil
FAST VIKING, 416 gt, HSC crew boat, DOPS-2, built by Breaux Bros Enterprises for Nautical Solutions
GULF STORM, 368 gt, HSC crew boat, DOPS-1, built by Swiftships Shipbuilders for Hercules Offshore
ISLA SAN GABRIEL, ISLA SAN LUIS, 482 gt, HSC crew boat, DOPS-1, built by Horizon Shipbuilding for TMM Division Maritima
JATI FOUR, 238 gt, HSC crew boat, built by Strategic Marine for Juragan Jati
L/B CAITLIN, L/B PAUL, 1,201 gt, lift boat, built by Rodriguez Boat Builders for Montco Offshore
LLUAVI, 462 gt, HSC crew boat, built by Strategic Marine Mexico for Arrendadora Ocean Mexicana
MR ZACHARY, 409 gt, HSC crew boat, built by Breaux Bay Craft for Gulf Offshore Logistics
NOMAD, manned passenger submersible, built by US Submarines for US Submarines
PAULA MCCALL, 496 gt, HSC crew boat, DOPS-2, built by Gulf Craft for Seacor Marine
SWISSCO SERVICE, 802 gt, landing craft, built by P T Steadfast Marine for Swissco Offshore
SYBIL GRAHAM, 427 gt, HSC crew boat, DOPS-2, built by C & G Boat Works for Graham Gulf
TOLL DRAGONFLY, 1,120 gt, landing craft, built by P T Tunas Karya Bahari for Toll Logistics
URRACA II, 20 gt, HSC crew boat, built by Metalcraft Marine for Autoridad Del Canal De Panama

OOCL NAGOYA, a 4,500 teu containership, SH, SHCM, built by Samsung H I for Orient Overseas Container Line.
### Recent Class Contracts

#### TANKERS
- Four 45,000 gt / 74,120 dwt for Omega Navigation Enterprises at Hyundai Mipo Dockyard
- Three 62,400 gt / 105,400 dwt for stock at Hyundai HI
- One 45,000 gt / 75,000 dwt for Betamax at Sungdong Shipbuilding & Marine Engineering

#### BULK CARRIERS
- Eighteen 90,900 gt / 175,800 dwt for stock at Zhoushan Jinhaiwan Shipyard
- Seven 51,000 gt / 92,500 dwt for stock at Jiangsu New Yangzi Shipbuilding
- Seven 23,000 gt / 34,790 dwt for Suisse Outremer Ahrenkiel at SPP Shipbuilding
- Two 95,000 gt / 158,850 dwt for Tai Chong Cheang Steamship at Daewoo Shipbuilding & Marine Engineering
- Two 65,500 gt / 116,000 dwt for D’Amico Dry Limited at Sanoyas Hishino Meisho
- One 95,000 gt / 180,000 dwt for Navios Maritime at Sungdong Shipbuilding & Marine Engineering
- One 95,000 gt / 180,000 dwt for Newlead Holdings at Sungdong Shipbuilding & Marine Engineering
- One 45,000 gt / 83,000 dwt for Seabreeze Marine at Sanoyas Hishino Meisho

#### CONTAINERSHIPS
- Seven 4,500 teu for A P Moller Maersk at Hyundai Samho HI

#### GAS CARRIERS
- One 147,210 m³ for stock at Hudong-Zhonghua Shipbuilding

#### OFFSHORE
- **Self Elevating Drilling Units**
  - One 5,000 gt for stock at Oceantec Industry

#### MISCELLANEOUS
- **Barges**
  - Four 2,300 gt for Ciesco at Jiangsu Huatai Shipbuilding
  - Three 4,285 gt for Waller Marine at Signal International
  - Three 3,150 gt for stock at Yangzhou Hairun Shipping
  - Two 4,370 gt for stock at Wujian Soho Xinsheng Shipyard
  - Two 2,300 gt for stock at Nanjing Nanjiang Shipbuilding
  - One 9,000 gt for Franklin Offshore International at Nantong Jiaolong HI
  - One 8,000 gt for stock at Poet Shipbuilding & Engineering
  - One 7,000 gt for China Oil Field Services at China Merchants HI
  - One 3,151 gt for stock at Nan tong Jinjian Shipbuilding & Repair
  - One 3,151 gt for stock at Taizhou Snafu Ship Engineering
  - One 3,150 gt for stock at Nanjing Yonghua Shipbuilding
  - One 2,500 gt for stock at Jinheng Ships Manufacture
  - One 2,340 gt for stock at Nantong Tongde Shipyards
  - One 2,300 gt for stock at Jinheng Ships Manufacture

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STEVEN C, a 34,340 dwt bulk carrier, BC-A, AB-CM, CSR, GRAB, TCM, GP, built by SPP Shipbuilding for One Navigation.

SANTOS SUPPORTER, a 2,999 gt offshore supply vessel, Fire Fighting Vessel Class 1, DPS-Z, built by Estaleiro Navship for Bram Offshore Transportes Maritimos.

ERIN SCHULTE, a 16,716 dwt tanker, ES, TCM, built by Jiangxi Jiangzhou Union Shipbuilding for Dorchester LNG.
Government Vessels
One 4,201 gt for Naval Sea Systems Command at VT Halter Marine
One 503 gt for US Army Corp of Engineers at Basic Marine

Tugs, Workboats and OSVs
Six 3,284 gt for Harvey Gulf International Marine at Eastern Shipbuilding
Two 1,678 gt for Offshore Support Vessel 10 at Fujian Southeast Shipyard
Two 1,200 gt for Valueright International at GMG Shipbuilding & Heavy Industries

Yachts
Two 500 gt for stock at Proteksan Turkuaz Yat San
One 500 gt for stock at Azimut-Benetti
One 500 gt for stock at Yildiz Gemi Makina

Others
One 2,642 gt special purpose vessel for University of Alaska at Marinette Marine

Polsteam Adds Another Bulker to Fleet
Dual classed with the Polish Register of Shipping, Polsteam’s POLESIE, a 38,069 dwt bulk carrier was recently delivered. Built by Tianjin Xingang Shipbuilding and Heavy Industry for Ares Nine Shipping, the bulk carrier carries the following ABS notations: BC-A, SHR, Ice Class “IC” and TCM.
We Welcome Your Thoughts

ABS Activities is intended to provide our Members and clients with ABS views, news and research. Editorial content is gathered from ABS engineering and field offices around the globe.

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The mission of ABS is to serve the public interest as well as the needs of our clients by promoting the security of life, property and the natural environment primarily through the development and verification of standards for the design, construction and operational maintenance of marine-related facilities.

ON THE COVER

DEEP OCEAN ASCENSION, a 60,860 dwt drillship, A1, Drilling Unit, E, AMS, ACCU, DPS-3, NBLES, SH-DLA built by Samsung Heavy Industries Company, Ltd. for Pride International Inc.